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NHS Wales user needs study including knowledgebase tools report. Report for Informing Healthcare Strategy implementation programme

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NHS Wales User Needs Study, including Knowledgebase Tools report

Report for

Informing Healthcare Strategy
Implementation Programme

By

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Executive summary

The **aim** of the research for the A2K (Access to Knowledge) project was to inform development of a National Specification for the procurement of e-sources based on analysis of need.

The **objectives** were to:

- Assess the existing (published) evidence on the options for purchasing, development and implementation of e-library resources in the health sector
- Investigate the existing and future user needs through empirical survey methods
- Identify gaps – in terms of content, functionality and accessibility – for existing provision and the future, basing the framework for content, functionality and accessibility on the published evidence, and stakeholder views collected in focus groups, and interviews
- Collate evidence from other relevant surveys and documents in Wales, surveys and statistics collected by libraries, to ensure the purchasing is informed by evidence and reflects policy requirements
- Assess the requirements for knowledgebase tools, training and support of e-resources

The **key messages** are:

Current HOWIS e-library provision of knowledgebases, and evidence-based resources is meeting the needs of most staff for clinical governance.

Staff value information for patient education but do not seem to be making optimum use of resources that might provide quality information for patients.

Various professional groups (e.g. community pharmacists, primary care) have unmet needs. Some, such as dentists and ambulance staff require further negotiation to assess the gaps and how to meet needs. There is interest in the Map of Medicine approach.

Some smaller clinical specialties may have unmet needs – given the demand for e-journals, full-text material, such needs could be met, at least partly, through e-journals.

Monitoring trends in usage would be considerably easier if authentication made it easier to identify main staff group usage (probably more useful than tracking usage by site).

GPs, junior doctors and allied health professionals require information on complementary therapies, and non-drug therapies.

Information on service planning, commissioning and reconfiguration is hard to obtain, and there is a perception that knowledge about practice in Wales could be easier to find.

Users want a simple Google type interface, with easy access to full text materials, but some also appreciate trusted question answering services, and digests of the evidence.

Health library services may need to liaise with RSC Wales services to find out how the needs of support staff (doing FE college courses) can be supported.

Training and support for e-library use are the responsibilities of many stakeholders (CPD providers, e-learning providers, content providers/aggregators as well as health library services, health informatics and ECDL training). One-to-one support may provide confidence and competence, but the training and awareness gap is large and simpler interfaces are some way in the future. A strategy for training and promotion by health libraries should be innovative – and, where possible, evidence-based.

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List of abbreviations

A2K : Access to Knowledge (Informing Health Care programme project to deliver and support e-resources to NHS staff in Wales.

ATTRACT: (Ask Trip To Rapidly Alleviate Confused Thoughts) project, designed to provide rapid evidence-based summaries to clinical questions, emerging from the TRIP project (Turning Research into Practice). Now part of the Welsh National Public Health Service.

BMC: BioMed Central (open access publisher)

CINAHL: Cumulated Index to Nursing and Allied Health

CPD: Continuing Professional Development

HMIC: Health Management Information Consortium

HOWIS: Health of Wales Information Service

HR Human Resources

ISI: Institute for Scientific Information

IT Information Technology

JCR: Journal Citation Reports

LHB: Local Health Board

NeSLi: National electronic Site Licence initiative

NICE: National Institute for Health and Clinical Excellence

NVQ: National Vocational Qualification

OUP: Oxford University Press

RDN: Resource Discovery Network

1 Introduction

1.1 Aims and scope

The **aim** of the research for the A2K (Access to Knowledge) project was to inform development of a National Specification for the procurement of e-sources based on analysis of need.

User need can be defined in personal terms of the individual's own CPD, research and practice needs but it is also important to assess the policy needs. The *Review of Health and Social Care in Wales*¹ indicated the need to reshape services, to encourage individuals to take more responsibility for their health, to base policy making on published evidence, but at the same time to encourage public involvement. While the current scope of the e-library excludes the general public, it would be important to be aware of how other policy drivers might affect the development of the e-library. The creation of all-Wales bodies (e.g. the Wales Centre for Health) and the development of research support (e.g. for nurses, midwives and health visitors) requires a holistic approach to the further development of the e-library. Principles of knowledge management need to be applied, to ensure that explicit knowledge and know-how are shared throughout Wales.

The **scope** is defined by the Access to Knowledge (A2K) project, part of the *Informing Healthcare* programme. A2K covers the procurement of electronic library resources, including knowledgebases, e-journals, textbooks (e-books) and clinical guidelines. The primary users are all staff employed by NHS Wales, and all staff in Wales individually contracted to provide NHS services, as well as all staff employed by various departments of the Welsh Assembly government. The A2K project is intended to develop a National Specification for the procurement of e-sources based on analysis of need.

Procurement of electronic library resources is increasingly done on a collaborative basis, to secure economies of scale, and for this reason the A2K project, and the user needs analysis, needs to consider how the business case (value for money, in particular) might be developed with another home country, or with higher education, bearing in mind the different goals of the partners in any consortium. Different goals and values affect views on the products and services involved (type of bundling, preservation), pricing models, and the way the purchasing 'service' is enforced and monitored, e.g. through usage statistics.²

1.2 Objectives

The summary **objectives** were to:

- Assess the existing (published) evidence on the options for purchasing, development and implementation of e-library resources in the health sector
- Investigate the existing and future user needs through empirical survey methods
- Identify gaps – in terms of content, functionality and accessibility – for existing and future, basing the framework for content, functionality and accessibility on the published evidence and stakeholder views collected in focus groups, and interviews

¹ Wanless D. *The review of health and social care in Wales*. 2003.
<http://www.wales.gov.uk/subieconomics/hsc-review-e.htm>

² Urquhart C. Applications of outsourcing theory to collaborative purchasing and licensing. *VINE* 2002; 32(4): 63-70.

- Collate evidence from other relevant surveys and documents in Wales, surveys and statistics collected by libraries, to ensure the purchasing is informed by evidence and reflects policy requirements
- Assess the requirements for knowledgebase tools, training and support of e-resources

The objectives, as specified in the tender document *Work Package for NHS Wales User Needs Study* are to:

- Assess whether existing needs are met by current provision of e-resources (nationally and locally), in terms of:
 - Content (e.g. match with clinical, educational and research requirements)
 - Functionality (e.g. are the search, sorting, and personalization options those required by the users)
 - Accessibility (e.g. how integrated should the knowledge base platforms be, what are the access/authorisation options, and what should the linking options between citation and full text document be)
- Assess future needs of the e-library
 - Training and support, and links with existing library services
 - Restructuring of health library services, as required for *Informing Healthcare*
 - Links with the Single Record
 - Links between NHS and HE/FE provision and support.
- Define and assess requirements for knowledgebase tools

It was important to assess not only the preferred design and interface, access and functionality, but also the implementation, training and support required. Training and support for IT have traditionally been viewed as discrete sessions of training, but recent research on the North Wales Clinical Librarian evaluation³ indicates that the impact of the clinical librarian working with clinical teams is to improve the willingness of staff to search for the evidence, as well as improving the effectiveness of the searches conducted by, and for the team. Most surveys of specialist database use within the health sector indicate that the majority of use comes from a small minority of users. Shifting that pattern requires a training and support strategy that is aimed at all staff, but targeted on relevant needs (e.g. journal clubs, junior doctor CPD support). The implications of the North Wales Clinical Librarian evaluation pointed to the need to review the way library services are organised for NHS Wales staff, if specialist librarian services are to be supported.

A structure will also be required to monitor requests for improvement in the e-library as the procurement process is fairly lengthy – and e-library developments in knowledgebase tools may advance over the period between drawing up the Outline Business Case, completion of the procurement, and initial implementation.

2 Methods

The methods used in the survey work comprised

- Staff surveys (Section 2.1)
- Focus groups with library staff and survey of librarians (Section 2.2)
- Expert informant interviews (to complement staff surveys) (Section 3.2)
- Literature review (to inform knowledge base tools assessment) (Section 3.1, 3.3, 3.4)

³ Turner J et al. *North Wales Clinical Librarian Project. Final project report.* Aberystwyth: DIS, 2005

- Analysis of usage statistics supplied by Health Solutions Wales (Section 4.2.4)

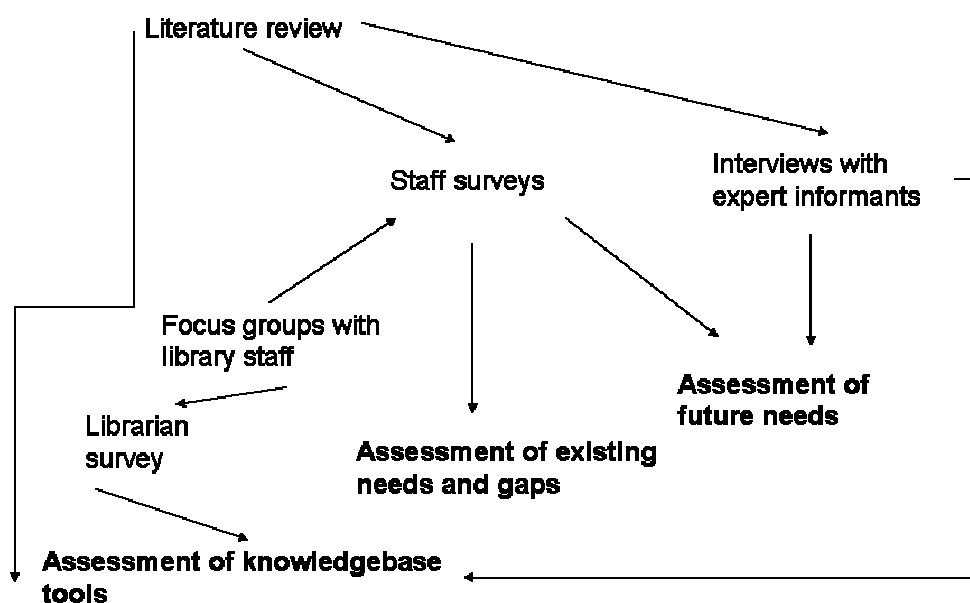


Figure 1 Relationships between components of the project

As Figure 1 indicates, various components of the survey work were related to each other. For example, the focus groups with the librarians were concerned both with arrangements for the random sampling and distribution of the questionnaires, and the discussion of the feasibility and desirability of some knowledgebase support tools.

2.1 Staff surveys (questionnaire and online)

2.1.1 Formulation of survey questions

From the outset, it was agreed the questionnaire needed to be as brief as possible. However, in order to achieve valuable, pertinent information from the questionnaire, the decision was taken to base it on a critical incident approach. This involved asking the staff the purpose of a recent use of HOWIS; what they were looking for, what they used and whether or not they were successful with their search. This was supplemented with questions on how easy/difficult they found searching for various disciplines and how important they regarded various available electronic services, where they mainly carried out their searches, what electronic resources were important for their work, what they used regularly and what they would find useful that was currently unavailable to them.

Several drafts of the proposed questionnaire were circulated to the project board, and the health librarians at the focus group days were also asked for their opinions and input. The final draft was an amalgam of these opinions and agreed with IHC (Informing Healthcare). Appendix 1 sets out the questions used (the final postal version was printed commercially and the layout different, the online questionnaire was also set out differently).

2.1.2 Distribution of questionnaires

It is notoriously difficult to secure good response rates with health service questionnaires so the team requested the help of the health librarians within the various Trusts to distribute the questionnaires within their areas. It was generally felt that some localisation of distribution would be advantageous for a better response rate. The numbers were arranged between them at the two focus days in South and North Wales and random selections were made within all areas. All questionnaires were coded for the various

samples and then sent on to the health librarians for distribution within their Trusts. Depending on the staff samples, respondents were either required to return their questionnaire to the Trust library, or Freepost envelopes were supplied for return directly to the project team. The Ambulance Trust randomly selected their staff sample and distributed the questionnaires directly from the Trust. Other samples such as LHBs and Pharmacists were distributed directly from the project team.

2.1.3 Working with local libraries

As already stated, the main reason for involving the health librarians was to try to secure a better response rate from the questionnaire. The problem of access to staff information within Trusts was a big issue and the tight project deadline did not allow for dialogue with HR departments within individual Trusts. Many librarians felt it would be more advantageous if the distribution of questionnaires came from them personally and that responses were more likely to come back to them at the library, rather than directly back to the project team. They agreed to carry out the random selections so that no staff information was ever made available to the project team outside the NHS.

The help of the health librarians was also crucial for the questionnaire. They know their users, and their knowledge of the electronic resource use in their Trusts and how their users view the electronic resources and proceed with search strategies is a good guide for any user needs analysis.

2.1.4 Response rates

The Internet responses came mainly from pharmacists, with other staff groups responding mostly to the Intranet survey (Table 1). Compared to the demographic profile of health staff in Wales⁴, the total number of responses (703) amounts to 1.1% of the health staff (by wte) in Wales (61,288 directly employed plus 4,171 GP support and 1671 GPs, wte). The staff groups under-represented, compared to the target numbers are ambulance staff (2 responses, 7 target), and there was also a low response from healthcare scientists. Groups that are over target include pharmacists, allied health professionals, managers and administrative staff. Comparing the online and postal questionnaire responses, the postal questionnaire (randomly sampled) reached nurses and midwives more successfully than the online survey. The allied health professionals' response to the postal questionnaire was much better than predicted.

Some coding response anomalies surfaced where 3 responses came back from the Ambulance Trust but one of them marked themselves as a nurse (acute). Likewise, a couple of healthcare scientists marked themselves as consultants and several junior doctors marked themselves as allied health professionals, with one allied health professional marking themselves as a healthcare assistant/auxiliary.

Of the 804 postal questionnaires distributed, 225 responses were obtained (28% response rate.)

⁴ National Assembly for Wales. Statistical Bulletins, 2005 (figures up to September 2004). Initial targets for individual staff groups calculated on the basis of draft figures in April 2005.

Staff group	Intranet online	Internet online	Sub-totals, online	% online	Quest.	% of quest. response	Totals	% of Total
Nurse acute	47	2	49	10.3	38	16.9	87	12.4
Nurse community /mental health	23	0	23	4.8	40	17.8	63	9.0
Midwife	3	0	3	0.6	14	6.2	17	2.4
Healthcare assistant/auxiliary	2	0	2	0.4	3	1.3	5	0.7
Healthcare scientist	0	0	0	0.0	6	2.7	6	0.9
Pharmacist	8	107	115	24.1	3	1.3	118	16.8
Allied health professional	57	1	58	12.1	62	27.6	120	17.1
Manager(any sector)	41	2	43	9.0	11	4.9	54	7.7
Public health	2	0	2	0.4	3	1.3	5	0.7
Consultant	30	1	31	6.5	13	5.8	44	6.3
GP	13	0	13	2.7	6	2.7	19	2.7
Junior doctor/registrar/SHO	7	0	7	1.5	12	5.3	19	2.7
Other hospital medical/surgical	8	0	8	1.7	1	0.4	9	1.3
Ambulance staff	0	0	0	0.0	2	0.9	2	0.3
Clerical/administration	65	1	66	13.8	3	1.3	69	9.8
Audit/research	5	0	5	1.0	5	2.2	10	1.4
Dental practitioner	2	0	2	0.4	2	0.9	4	0.6
Other - not specified	17	0	17	3.6	1	0.4	18	2.6
Blanks- missing data	33	1	34	7.1	0	0.0	34	4.8
Totals	363	115	478	100	225	100.0	703	100.0

Table 1 Survey response

Initial target figures were calculated on the basis of draft wte staff figures for September 2004 (available in April 2005), and these are presented in Table 2. The target percentage for each staff group was a compromise between the resource costs required to target large staff groups (such as nurses) in a postal questionnaire survey, and the need to obtain the views of smaller staff groups whose specialist needs may be unmet. The groups with specialist needs were presumed to be:

- Pharmacists (around 50% of these are contractors)
- Healthcare scientists
- Therapists (speech therapists, physiotherapists, clinical psychologists etc)
- Audit and research staff, public health staff
- Ambulance staff

In the postal questionnaire survey, efforts were made to target these groups. Obviously, in the online survey, no such controls are possible, and it is likely that the responses there are biased towards those who use HOWIS in either the Intranet or Internet version on a regular basis.

Staff group	Number in survey	Target number	Population (wte)	Target % of population	Notes
Consultants	44 + 4 dental practitioners	14 (including two dentists)	1503	0.93%	
GPs	19	18	1816	0.99%	Used actual number in calculations, as large number part-time (Wte 1671)
Junior doctors	19 + 9 other doctors	30	3020	0.99%	
Audit & research staff	5 public health 10 audit/res.	5	Not known		Included public health in sample
Nurses	167 (87 acute, 63 community, 17 midwives)	150 (90 acute, 60 community + midwifery)		0.55%	Includes support staff, midwifery
Therapists, scientists and technical staff	6 scientists 118 pharmacists 120 allied health	61	9384	0.65%	
Pharmacists	11 +107(contractors)	20 (10 contractors)	2035	0.98%	
Managers	54	11	2073	0.53%	
Ambulance	2	7	1348	0.52%	
Admin (other)	69	14	18848	0.07%	Included GP support staff
Other	5 health care assistant, 18 'other' 34 blank				
TOTALS	703	310			

Table 2 Targets for staff group response

As Table 3 indicates, targets were met for most groups of staff, with the exception of the ambulance staff, and (to a lesser extent) junior doctors. However, the ideal would have been to meet the targets from the randomly sampled participants, and use the online survey as further confirmation.

Staff group	Population (wte)	Target % of population	Response	Actual target % achieved
Consultants	1503	0.93%	48	3.2%
GPs	1816	0.99%	19	1.0%
Junior doctors	3020	0.99%	28	0.93%
Audit & research staff	Not known		10 + 5 public health (over target)	
Nursing	27407	0.55%	172	0.63%
Therapists, scientists and technical staff	9384	0.65%	244	2.6%
Pharmacists	(approx 2035, around 1000 contractors)	1.00%	118	5.8%
Managers	2073	0.53%	54	2.6%
Ambulance	1348	0.52%	2	0.2%
Admin (other)	18848	0.07%	69	0.36%

Table 3 Success rates for staff group targets

The **implications** are:

- A mix of methods is necessary to reach all staff groups, as different staff groups may respond in different ways (there may be small site variations but the response rate varies predominantly by type of survey)
- The results (overall) will be biased more towards the views of pharmacists, managers, administration staff, therapists and allied health professionals than their proportion in the staff population actually is.

As managers, administration staff, and allied health professionals have sometimes not been served fully by libraries funded for postgraduate medical education or nursing education, this is possibly not such a bad outcome, although it would have been preferable to have obtained a better response from the postal survey of staff, which was a random sample. As it is, those results represent only 32% of the total number of respondents.

The usage statistics (Section 4.2.4) provide another perspective on usage, but the way the Athens authentication is set up makes it impossible to assess any trends in usage by staff group, unless it can be assumed that particular resources will only be used by one professional group.

2.2 Librarian focus groups, librarian survey

As indicated in Section 2.1, focus groups with library staff were held in South Wales (22 June 2005) and North Wales (24 June 2005). Part of the workshop was involved with the arrangements for random sampling for the postal questionnaire, the other part was preparation for the survey of librarians concerning the likely demand for various knowledgebase tools (Appendix 2). A questionnaire (Appendix 3) was sent out to all librarians serving NHS staff in Wales to collect views on knowledgebase tools. A total of 13 responses was obtained (approximately a 66% response rate, as some sites collated their responses). Results are presented in Section 4.5.

3 E-library purchasing and development

3.1 Approach to literature review

The evidence for the report was gathered in several ways:

- Search on LISA, using the terms such as digital libraries, electronic libraries, health/medical, purchasing and searches on MEDLINE (using PubMed to locate similar articles).
- Internet search to locate further details on organisations involved in open access or government and national organisations' reports on publishing and access to the biomedical and scientific literature
- Use of personal collections of literature on needs analysis, and purchasing.

3.2 Survey of expert informants

Expert informants (n=21) were interviewed (around 30 contacted). Of the 21 interviewees, 3 were interviewed in one conference call, 17 were interviewed personally by telephone, and one provided full details over email. The informants were selected to represent clinical views (with an emphasis on all-Wales policymaking) or to represent e-library resource providers, publishers or aggregators. Questions were tailored to the interviewee, and an interview guide sent in advance of the interview, to help in preparation. Interviews were transcribed, with the interviewee's permission, and the various themes identified through content analysis. The qualitative data analysis was used in two ways:

- to complement the literature review on knowledgebase support tools (e.g. by providing evidence on the desirability of some support tools)
- to reflect on the findings of the user needs survey (in the findings, Section 4 and in the discussion, Section 5).

3.3 Knowledgebase support tools

3.3.1 Monitoring usage of e-library resources

The **e-measures project**⁵ based at the University of Central England is refining a set of e-measures that will assist higher education libraries in the collection of data on usage of electronic resources. The project hopes to comply with the code of practice being developed under **Project COUNTER (Counting Online Usage of Networked Electronic Resources)**. COUNTER⁶ is building on the work of the e-measures project, as well as some other, mainly North American initiatives such as the ARL new measures initiative, the NISO forum on performance measures and statistics for libraries and NISO Standard Z39.7, and the ICOLC (International Coalition of Library Consortia) guidelines for statistical measures of web-based information resources.

Release 2⁷ (which becomes valid on January 2006) makes two changes to the content of usage reports:

- Publisher and platform of the database or journal is included
- Counts of successful requests for html and pdf full text articles listed separately

Vendors are required in most cases to provide aggregated usage figures for the entire consortium as well as individual reports for each consortium member. The protocols to be used for recording and reporting usage when an intermediary aggregator or gateway is

⁵ More about the e-measures project (Web page).

<http://www.ebase.uce.ac.uk/emeasures/moreemeasures.htm>

⁶ <http://www.projectcounter.org/cop2.html>

⁷ COUNTER. Draft release 2 of the COUNTER code of practice for journals and database. <http://www.projectcounter.org> retrieved 10 Aug 2005

involved have been collected together, to avoid duplication of counting by the publisher that owns the content and the aggregator/gateway that provides access to it.

3.3.2 Authentication and authorisation tools

The current authentication and authorisation solution under development **Shibboleth** provides a way of authentication as well as assessing whether users should be access to certain restricted access resources.⁸ The SDSS project at EDINA⁹ is building a development Shibboleth federation for higher and further education. One of the projects funded by JISC is the IMPETUS project¹⁰, a collaborative project between the University Hospitals of Leicester, University of Leicester and De Montfort. If this works, it may offer some solutions to the problem of inter-institutional sharing of resources between NHS and HE institutions.

E-resource providers and aggregators believe that users need a single sign on that will allow them, e.g. for England:

'There is content that is bought nationally...There's content that may be purchased...at SHA level, and content that's bought locally by individual Trusts...So the whole access mechanism has to take account that any individual user potentially will be accessing content from any of those three categories, local regional and national. And whenever possible we endeavour to make it so that with a single sign on (ATHENS) a user can access the appropriate content without being challenged for a user name and password here, a user name and password there.' (stakeholder 16)

Some publishers (often American) do not wish to be ATHENS compliant and one solution for UK libraries is to use an aggregator that can offer an ATHENS-compliant platform.

3.3.3 Searching tools

MetaLib¹¹ allows librarians to catalogue their library's e-collection (e.g. library catalogue, bibliographic databases, subject gateways, digital repositories, e-journals) to help users to find groups of resources of interest to them through one unified interface. Libraries can extend this to OAI-compliant resources.

Other tools being applied by the content providers are the type of tool that is like the PubMed **'find similar'**, to find articles that share similar keyword terms, or the **'citing, citation searches'**:

'in certain databases if you find the record that's maybe very relevant and is six months or 18 months old you can find more recent material which has cited that paper. And that is something that's offered in an ISI Citation Index but increasingly it's available more widely, and it's done on the fly...And then there's the third thing which is what we call 'find citation' which can be a bit misleading as a name and that is a very simple type of search screen which helps the novice user where you can just put in part of an author's name, part of a title, part of a journal and so on, just any combinations of those and it helps you if you're looking a specific paper.'

3.3.5 Access to articles (link resolvers)

Open linking using the **OpenURL** framework is based on SFX research.¹² An extended service link may link from a record in a bibliographic database to the full text, or from a

⁸ Internet2. Shibboleth. <http://shibboleth.internet2.edu/> retrieved 10 Aug 2005

⁹ EDINA. SDSS development federation. <http://sdss.ac.uk/> retrieved 10 Aug 2005.

¹⁰ IMPETUS. http://www.jisc.ac.uk/index.cfm?name=project_impetus

¹¹ MetaLib the library portal. http://www.exlibrisgroup.com/metalib_institutions.htm

¹² Van de Sompel H, Beit-Arie O. Open linking in the scholarly information environment using the open URL framework. *D-Lib Magazine* 2001; 7 (3), <http://www.dlib.org/dlib/march01/vandesompel/03vandesompel.html>

book in a library catalogue to an Internet bookshop, or from a reference in a journal article to the record in the bibliographic database. There are more options such as linking from a citation in a journal article to a record in the catalogue that indicates the library holdings of that cited journal. Such frameworks may be closed or non-context sensitive (in taking into consideration the particular subscription status of the journal or the licence conditions). This might result in the user being presented with a page that indicated that they were denied free access when in fact access was possible, or that access was possible in another way. **SFX** (for special effects) provides an open and context sensitive linking framework, and the context is related to the user's institutional affiliation. The provision of linking services is distinct from the description of the document as presented to users. In the **OpenURL** framework information resources have a hook (the openURL) that takes the user to extended services for that document or work.

SFX, available from ExLibris¹³ allows librarians not only to configure the link to permit access to full text, but also, where appropriate, to provide access to the library catalogue for print holdings or make an document delivery request. ExLibris provide a list of predefined targets but librarians may also develop their own. ExLibris also claim that it would be possible to check unmediated document delivery requests against local holdings before submitting those requests. The DigiTool system supplied by ExLibris allows libraries to upload digital assets and create associated metadata. 'The robust **DigiTool Repository**, which lies at the heart of the system, is responsible for storing and managing the digital objects--such as images or text files--and associated metadata. Whereas metadata is stored in the Repository's Oracle-based database, uploaded objects are stored in a secure network file system (NFS) or on remote systems accessed via URLs. A standard Web services (SOAP) layer enables the Repository to interact with the other DigiTool modules as well as with local or third-party systems'.¹⁴

The **NISO** committee AX is working (fast track) on an OpenURL standard.¹⁵ This the ANSI/NISO Z39.88-2004 draft standard for this open technology (SFX is a de facto standard, NISO the general approach¹⁶ and various approaches are demonstrated on the site). The OpenURL developed from work at Ghent University on the linking of heterogeneous collections (1999). At the same time ANSI/NISO was examining the appropriate copy problem – which copy, when multiple copies are available, is right for the library user? In 2000 Caltech started up an SFX service, and others followed. In early 2000 Ghent University signed over the rights for SFX to ExLibris.

The OpenURL framework has two key deliverables: 1) a data model (the ContextObject – entity descriptions detailing type of descriptors, uniform resource identifiers, formats (with KEV or XML representations, and trial Dublin Core (KEV) format) and 2) Registry mechanism to publish identifiers, metadata formats etc.

Crossref is the official, non-profit, registration agency for scholarly and professional publishers, acting to co-ordinate efforts among publishers to make access to online research content easier for users. 'The linking uses the **DOI**, the digital object identifier, a **unique alphanumeric string** assigned to a digital object – in this case, an electronic journal article or a book chapter. In the CrossRef system, each DOI is associated with a set of basic metadata and a URL pointer to the full text, so that it uniquely identifies the content item and provides a persistent link to its location on the internet. OpenURL is a syntax for transporting metadata and identifiers within URLs, and CrossRef is a DOI registration facility. These initiatives complement one another and work together.

¹³ SFX context sensitive linking. <http://www.exlibrisgroup.com/sfx.htm>

¹⁴ ExLibris. DigiTool Digital asset management. <http://www.exlibrisgroup.com/digitool.htm>

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¹⁵ NNISO Committee AX. Development of an OpenURL standard.

<http://library.caltech.edu/openurl/> retrieved 10 Aug 2005

¹⁶ Hammond T. OpenURL – The rough guide. Available from Presentations, <http://library.caltech.edu/openurl/> retrieved 10 Aug 2005

CrossRef uses the OpenURL syntax in its own system for metadata retrieval and parameter passing, and makes all of its publishers "OpenURL compliant" for its library participants, by allowing them to retrieve publisher metadata from the CrossRef system.'

¹⁷ Earlier work on reference linking with DOIs, the DOI-X prototype metadata database explored interactive and batch lookup mechanisms, and noted the need for guidelines for link presentation, and the minimal response page (indicating e.g. that the content is not free).¹⁸

The Crossref explanation of how the DOI and OpenURL work together:¹⁹

'The DOI and the OpenURL work together in several ways. First, the DOI directory itself - where link resolution occurs in the CrossRef system - is OpenURL-enabled. This means that it can recognize a user with access to a local resolver. When such a user clicks on a DOI, the CrossRef system does two key things: (1) it redirects that DOI back to the user's local resolver, and (2) it allows the DOI to be used as a key to pull metadata out of the CrossRef database, metadata that is needed to create the OpenURL targeting the local link resolver. As a result, the institutional user clicking on a DOI is directed to appropriate resources. By using the CrossRef DOI system to identify their content, publishers in effect make their products OpenURL aware. Secondly, since DOIs greatly streamline linking and data management processes for publishers, more publishers are beginning to require that the DOI be used as the primary linking mechanism to full text. Link resolvers can use the CrossRef system to retrieve the DOI, if the DOI is not already available from the source (i.e., citing) document. In order to take advantage of localized linking, a cookie must be set on the user's machine.

Citebase, a Web-based citation and impact-ranked search service has supported the development of the **EPrints.org** software for building OAI-compliant archives.²⁰ The project at Cornell University investigated how, using object-oriented technology (Java) it would be possible to get a digital object to return the metadata about that object (its cataloguing description), to return its list of references, to get the other works that have cited that object, and to return the original content of the digital object with link to a full online copy. The Open Citation project aims to produce tools to manage repositories more effectively and increase their attractiveness (by increasing the visibility of the content) to those depositing material.

The **CORES** project (Information Society Technologies Programme, European Union) is concerned with metadata elements and the CORES resolution is an agreement among maintenance organisations for several metadata standards (including Dublin Core) to identify their metadata elements using Uniform Resource Identifiers.²¹

E-resources suppliers expect to provide such linkages and easier links can make the difference between customers purchasing one collection rather than another.

'And the reason we chose [name] was the range of titles but also it was much easier to link through to their full-text than it was through [name] at the time.'
(stakeholder 4)

¹⁷ Crossref. Fastfacts. <http://www.crossref.org/03libraries.index.html>, retrieved 10 Aug 2005

¹⁸ Atkins H et al. Reference linking with DOIs: a case study. *D-Lib Magazine* 2000; 6(3), <http://www.dlib.org/dlib/february00/02risher.html>, retrieved 10 Aug 2005

¹⁹ Crossref. Fastfacts. OpenURL and Crossref.

<http://www.crossref.org/03libraries/16openurl.html>, retrieved 10 Aug 2005

²⁰ Hitchcock S, Bergmark D, Brody T, Gutteridge C, Carr L, Hall W, Lagoze C, Harnad S. Open citation linking: the way forward *D-Lib Magazine* 2002; 8 (10)

<http://www.dlib.org/dlib/october02/hitchcock/10hitchcock.html>

²¹ Baker T, Dekkers M. Identifying metadata elements with URIs. *D-Lib Magazine* 2003; 9 (7/8), <http://www.dlib.org/dlib/july03/baker/07baker.html>

For e-resources suppliers and aggregators, open linking is a selling point for libraries if they can offer a service that allows:

'A durable or fixed URL for each tittle. So if a library wants to link from their page of their own catalogue from a title listing - let's say to the actual content then having that durable URL means they don't have to keep changing it when publishers change things...

...let's say a library is using a (name) database, they (users) read.. a particular table of contents from the most recent issue, they want the full text but it's embargoed...you don't want the user to have to move from one platform to the other...now the user may not realise that the full text is being delivered by a journal subscription rather than by the database but they actually don't need to.' (stakeholder 16)

3.3.6 Personalisation of the interface

The NHS Scotland service has a **'My Knowledge Space'** feature which allows the user to personalise their page, setting up a Specialist Homepage and alerting services.

The **National Library for Health site** is aiming for personalisation²² including the use of search profiles for databases, alerting services via RSS, and personalisation of resource presentation. The Professional Portals are being wound down and replaced with current awareness and personalisation services.²³ NLH resources may be organised into specialist libraries, guidance (e.g. NICE), evidence, clinical databases and journals/books.

Personalisation was mentioned by some interviewees, noting that a wide range of resources might be required by an individual, far beyond what would be expected from HOWIS itself:

'so that all staff can get access to the evidence they need to do their job...access to the physical resources pulled off the Internet remains equally important'.

Just as Amazon 'remembers' your profile and previous purchases, so a personalised interface should go beyond what you have bookmarked but also what you have tended to use most of, so the most frequently used services are more prominent.

The alerting services via **RSS** (Really Simple Syndication) allows

'people to pull a particular type of content regularly to their own web browsers or portals...we are currently working in developed in the RSS interface which are search based so somebody can execute a particular search and then the system would come back and give them the address for RSS feed subsequently we could feed all the results, future results of that search, through RSS to RSS client or a web portal which deploys the RSS interface' (stakeholder 10)

For users who have to collect information from a large number of resources, including Internet-based resources as well as databases, the RSS principle is attractive, particularly for the allied health professions that are multidisciplinary and require access to material in other disciplines (e.g. speech therapy, occupational therapy)

3.3.7 Clinical question answering services

Most of these services deal with individual questions, summarising the evidence into a response.

In many respects, the Health Evidence Bulletins Wales are a more structured version of clinical questions, although the questions are structured in the form of topic statements

²² National Library for Health. http://search.library.nhs.uk_sse , accessed 24 Aug. 05

²³ <http://www.library.nhs.uk/forLibrarians>

associated with aspects of a particular clinical condition, its prevalence, treatment and prognosis. The two column format used is popular, but the paper bulletins are to be phased out, and the bulletins used to support National Service Frameworks for Wales.

The NKS commissioned a review of primary care clinical question answering services in 2005. The executive summary²⁴ indicates that there are 23 such services in England and Wales, and half of these have been launched since 2004. The vast majority are medicines queries, handled by UKMi. Overall, hospital doctors are the main users. In both acute and primary care, doctors, nurse and allied health professionals are key user groups. Managers are among the main user groups for more than a third of the services, and three clinical question answering services support pharmacists. The majority of services work to agreed procedures, have defined levels of evidence and recommendation, and

A comparison between the Imperial and Basildon informaticist services²⁵, both of which used a clinician as the 'informaticist' indicates that it is difficult to please everyone all of the time. A service that focuses on the technical quality of answers, with a turnaround time of two weeks or less is satisfactory for many GPs. On the other hand, without a friendly approach that invites more practitioners to pose questions, and which emphasises pragmatic answers, the service is likely not to thrive, or to survive supported only by a small group of enthusiasts. It is a delicate balancing act between pragmatism and highly credible appraisal.

3.3.8 Care pathways and Map of Medicine

From the perspectives of some stakeholders, the key concern is the quality of patient care, which requires engagement of staff with clinical pathways, and the resources, appropriate to a particular staff group would hang off this (an approach similar to the Map of Medicine principles)

'an e-library of first of all care pathways, common agreed care pathways with hyperlinks to a particular, either a multidisciplinary focus, or a uni-disciplinary profession...I think that people will hold on to their uni-professional routes...that would also like much closer to the way policy is taking us with Design for Life etc, because it's all about complex care management across all disciplines.'
(stakeholder 1)

3.3.9 Clinical guidelines and clinical networks

An interim evaluation²⁶ of the Managed Clinical Networks, conducted with nine interviews, indicated that the electronic format saved time as professionals would signpost how to access the information to others, rather than copying and sending off copies. Professionals had built up their own 'Yellow Pages' of experts, and some of the individuals who recognised that they were viewed as specialists undertook to do some processing or distillation of the main points, voluntarily as they recognised they were viewed as a 'resource'.

An interviewee noted that there would be a need for personalisation and localisation of guidelines, as well as recognition that there will be levels of authority with guidance (just as there are levels of evidence).

²⁴ Lacey Bryant S. A national audit of clinical question answering services. A report to the NHS National Knowledge Service. Executive summary (personal communication 18 November 2005)

²⁵ Swinglehurst D. Information needs of UK primary care clinicians. *Health Information and Libraries Journal* 2005; 22 (3): 196-204.

²⁶ Burnett S, Williams DA, Webster L. Knowledge support for interdisciplinary models of healthcare delivery: a study of knowledge needs and roles in managed clinical networks. *Health Informatics Journal* 2005; 11 (2): 146-160.

'There'll be a difference between the stuff which is sort of like official, has official endorsement...like NICE guidelines, and NSF...and other things that are evidence based...but maybe are not yet, don't yet have a kitemark from the point of view of UK health departments, or the Welsh Assembly. There'd be all sorts of stuff which is from professional bodies. And...in Wales we have got a body set up which will...adopt clinical standards' (stakeholder 8)

The National Library for Health in England has tried to foster the development of Specialist Libraries, communities of practice for multidisciplinary groups. Although their professional portals are being wound down in favour of alerting services, the principle of aggregating the information inputs, presenting information on a website of interest to a particular user group is something that some of the content providers think is a 'good thing' to do.

'We'd suggest going even further sort of portals or if you like web sites for particular professions. And it's a way of presenting the existing information but presenting in a more user friendly way and perhaps a more intuitive way...to help overcome this 'how do we actually get people to use this.' (stakeholder 10)

3.3.10 Library policy surveys

A study conducted by Pleiade Management and Consultancy in late 2003, and financed by Elsevier, examined the functionality of various abstracting and indexing database platforms, and the perceived relevance of the functionality to the library's staff and users.²⁷ The functionality list was derived from a survey of the publicly available literature from providers plus interviews with expert informant librarians. A web-based survey of more than 500 university librarians (63 responded) asked for a rating of the importance of various functionalities. Results indicated divergent opinions on the usefulness of local link resolvers (as compared to the standard full text linking of the abstracting and indexing database platform). More libraries (44%) linked all resources with their own link resolver in addition to the other type of full text linking than those (14%) linking all resources only with their own link resolvers. There was limited enthusiasm for the federated search engine, although around a quarter agreed that the importance of the abstracting and indexing database was less with the emergence of federated search engines. Most librarian respondents agreed that COUNTER compliant usage statistics were very important, and a majority wanted a more precise authentication and authorisation system. Citation functionality (like PubMed related articles) was desirable. The type of federated search engine functionality required was Z39.50 compliant, SRW (next generation Z39.50) compliant and an XML gateway. The variety of linkages possible via CrossRef was not particularly important (to the librarians) although the number of journals covered by full text linking was. The ability to provide library branding was considered very important.

As far as searching options were concerned, librarians wanted two types of search screen, one basic and one for advanced searching. Librarians also wanted the core Boolean searching with right hand truncation and phrase searching. They thought that the ability to limit outputs to those records with full text available would be popular with the users, and sorting by relevance would also be important. Various export options should be included, particularly the ability to export to personal databases.

3.4 E-library purchasing models

3.4.1 Development, use and non-use of purchasing consortia

The **big deal** is favoured by commercial publishers (particularly the dominant publishers) as it give them an opportunity to squeeze out the other publishers when library budgets

²⁷ Van der Graaf M. A report on the functionality of abstract & indexing (A&I) database platforms: recent developments, library policies and a new evaluation technique. Scopus White Paper series no. 3. 2004 From <http://www.info.scopus.com/aboutscopus/development/what/> , retrieved 10 Aug 2005

are relatively static and libraries can be tied into longterm deals. In the UK the NESLI (National Electronic Site Licence Initiative) started in 1998, and individual publishers make bundled offers, to meet needs set out by libraries, with varying degrees of electronic access. The problems for the libraries concern the basis of the costing. The potential user population is far higher than the core users *'the potential number of people in [name] who could join the library is probably 150,000...in fact only about 12,000 ever join the library, less than that would have ATHENS authentication'* (stakeholder 14). For full-text journals, the number of journals offered is really far less important than whether the core journals are included. For aggregators, there are several considerations: whether or not to accept individual publisher's decisions on time lag they wish to have between appearance of the paper journal and the licensed electronic version, and how far back they might wish to digitized back issues.

Recently some large American libraries have withdrawn from big deal consortial purchases. For example, the Triangle Research Libraries members could not manage the lack of cancellation allowance with Elsevier Science Direct and Blackwell Synergy, and each institution then opted to pay for individual subscriptions.²⁸ The Irish university consortium IReL of 7 universities has also noted a lack of flexibility although they did request no 'no cancellation' clauses in their 5-year deal covering 3,500 titles from 20 publishers. Other conditions that had to be met by the publishers were: electronic only (no bundling), authentication via IP or Athens, perpetual access, material available for ILL and coursepacks, and COUNTER-compliant usage statistics.

For publishers the difficulty of dealing with the NHS is knowing where the NHS stops. Researchers working in charities, government departments who have some type of dual role are likely to be heavy users of specialist resources, and publishers would prefer to make arrangements with the two groups, NHS and non-NHS separately.

'They don't want to cannibalise their market so they want to be careful that whatever price they set that they know exactly who that covers, they can balance it off against any potential loss of revenue from other sources.' (stakeholder 3)

'We tried to have it(e-resources deal) as inclusive as possible. Excluded was obviously members of the public, and students weren't included except when they were on placement. When they were on placement they could have access. And [name] didn't have any problems with that...[name] didn't raise any problems and [name] raised a number of issues about needing to know exactly the number of working organisations and list all the organisations. At that time we didn't know what the organisations would be.' (stakeholder 4)

One model that is practised in some areas of the UK is for individual Trust libraries to club together as mini-consortia which allows them to meet the turnover thresholds specified in the national contract for some suppliers, and achieve better terms as a result (stakeholder 16)

3.4.2 Open access publishing

Philip Davis, a librarian at Cornell University has likened the traditional model of scholarly publishing as a 'tragedy of the commons'.

'Publishers are exploiting the academic library, by pricing journals on what the market can bear and by invoking a price discrimination model between individual and institutional copies. They have also guaranteed immunity to attrition by bundling resources and by building non-cancellation clause into their licenses. Scholars are also to blame, by maximizing the production of information and by insisting that the library provide free access to all other information that might be of use. Lastly, librarians are to blame, by building comprehensive collections as

²⁸ Pearson S. The UK Serials Group Annual Conference 2005. *Ariadne* 2005; (43), <http://www.ariadne.ac.uk/issue43/uksg2005-rpt> (Gibbs)

*status symbols and by insisting that unlimited and free access is a guaranteed right for any and all potential users, wherever they may be.*²⁹

There have been several key developments³⁰ over the past two years:

- Berlin declaration³¹ on Open Access to Knowledge in the Sciences and Humanities, signed by leading European research associations
- JISC agreement³² with four publishers (Public Library of Science, (PloS for biology), Institute of Physics Publishing (New Journal of Physics) Journal of Experimental Botany at Lancaster University, and the International Union of Crystallography (IUCr) to move towards or continue open access delivery to their journals.
- JISC, with Open Society Institute, survey³³ of authors (which showed that authors supported the principle of open access)
- US House Appropriations Committee report, concerning public access to National Institute of Health funded research and backing open access³⁴
- House of Commons (UK) Science and Technology Committee Inquiry into Scientific Publications³⁵.
- European Commission study³⁶, starting June 2004, into the economic and technical evolution of the scientific publication markets in Europe.
- Wellcome Trust proposals for all their grant recipients to place the research results in a public access depository of research papers within 6 months of publication.³⁷
- Research Councils UK press release on the mid-term results of consultation (further round closing 31 August 2005) which sets out four principles concerning the need for publicly funded research to be made available rapidly, effective mechanism to be in place for quality assurance of published research outputs through peer review, models for publication and access to be cost-effective and efficient, and the need to consider preservation and long-term access. The policy (at present) would make it mandatory for grant recipients to deposit a copy of their research articles in an open access repository at the earliest opportunity, and with permission of publishers³⁸
- NIH policy on enhancing public access to archived publications resulting from NIH research³⁹. This requests (not requires) authors to submit to the NIH PubMed Central an electronic version of the author's final manuscript upon acceptance for publication, including all modifications from the publishing peer review process, and applies to

²⁹ Davis PM. Tragedy of the commons revisited: librarians, publishers, faculty and the demise of a public resource. *Portal: Libraries and the Academy* 2003; 3 (4): 547-562. <http://muse.jhu.edu>

³⁰ Scientific publishing: access all areas. *The Economist* 7 August 2004, 72-73.

³¹ Berlin declaration on open access to knowledge in the sciences and humanities. <http://www.zim.mpg.de/openaccess-berlindeclaration.html>, accessed 18 August 04

³² Press release: JISC and publishers work together to open up access to journals http://www.jisc.ac.uk/index.cfm?name=news_openaccess_03004, accessed 18 August 04

³³ JISC/Open Society Institute Journals Authors Survey – via page above.

³⁴ SPARC. Federal Taxpayer-Access Proposal. <http://www.arl.org/sparc/core/index.asp?page=o31>, accessed 18 August 04

³⁵ UK Parliament. House of Commons Science and Technology Committee. <http://www.publications.parliament.uk/pa/cm200304/cmselect/cmsctech/399/399.pdf>

³⁶ Europa Press releases. An effective scientific publishing system for European research. <http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/04/747&format=HTML&aged=0&language=EN&guiLanguage=en>, accessed 18 August 04

³⁷ Wellcome Trust. Wellcome Trust and National Library of Medicine in talks for worldwide open access archive. http://www.wellcome.ac.uk/doc_wtx022826.html retrieved 09 Aug 2005.

³⁸ RCUK. RCUK announces proposed position on access to research outputs. <http://www.rcuk.ac.uk/press/20050628openaccess.asp>

³⁹ NIH. Policy on enhancing public access to archived publication resulting from NIH-funded research. 3 Feb 2005. <http://grants.nih.gov/grants/guide/notice-files/NOT-OD-05-022.html>

research supported in whole or part with direct costs from NIH. The policy suggests that authors post as soon as possible and within 12 months of the publisher's official date of final publication.

A conference in June 2004, the Publisher and Library/Learning Solutions (PALS) conference⁴⁰ on institutional repositories noted that much of the discussion has focused on the needs of research but increasingly the digital learning resources are receiving attention (and the associated intellectual property problems). One of the messages coming through is that academics need to be encouraged to deposit material in repositories, as demand is actually increasing faster than supply at the existing, comparatively small repositories (e.g. MIT, Caltech). Repositories need software and interoperability is a key requirement. The JISC funded SHERPA project⁴¹ aims to create a corpus of research papers from several leading research universities in the UK, an 'e-prints archive' compliant with the Open Archives Initiative (OAI) Protocol for Metadata Harvesting using eprint.org software. Baseline surveys⁴² show disciplinary differences.

A current project that involves SHERPA is the OpenDOAR project that will categorise and list the wide variety of open access research archives that have been established throughout the world. The project is a joint collaboration between the University of Nottingham (which leads SHERPA, and runs the SHERPA/RoMEO database reference on publishers' copyright policies) and the University of Lund in Sweden that operates the Directory of Open Access Journals.⁴³

The problem of fostering change is apparent when reviewing the responses to the House of Commons Scientific and Technology committee report.⁴⁴ The Government refused to implement the main recommendations such as the funding of a central body to co-ordinate and implement a network of institutional repositories, and viewed the scientific publishing sector as 'healthy and competitive'. The government response stresses the importance of interoperability, commends research councils' support of research data and results being made publicly available, and endorsed the role of the JISC to 'explore the establishment of a Content Procurement Company'. This company might negotiate not just for higher and further education but also for the NHS.

- Journals business models study.

King⁴⁵ notes that public/private sector interaction, even if this amounts to tamed competition can be ultimately productive for the public good. Author payment for publication is not new, but the measurement of its effectiveness is a matter of debate. King suggests that commercial publishers, who have usually covered the costs of processing and reviewing in subscription costs could compete in the author pays environment normally associated with some learned societies but that the basis of competition would change. Authors would possibly become very aware of the attributes of

⁴⁰ Paulus K. Conference feature: institutional repositories and their impact on publishing. http://www.jisc.ac.uk/printer_friendly.cfm?name=pals_conf_rep_news_020704, accessed 18 August 04

⁴¹ SHERPA: Securing a hybrid environment for research, preservation and access. http://www.jisc.ac.uk/printer_friendly.cfm?name=project_sherpa, accessed 18 August 04

⁴² Andrew T. Trends in self-posting of research material online by academic staff. *Ariadne* 2001; (37) <http://www.ariadne.ac.uk/issue37/andrew/intro.html>

⁴³ University of Nottingham. The Directory of Open Access Repositories – OpenDOAR. <http://www.opendoar.org/>

⁴⁴ UK Parliament. House of Commons Science and Technology Committee. *Responses to the Committee's Tenth report, Session 2004-04, Scientific publications: Free for all?*, HC 1200. London: Stationery Office Ltd, 2004.

⁴⁵ King DW. Should commercial publishers be included in the model of open access through author payment? *D-Lib Magazine* 2004; 10(6): <http://www.dlib.org/dlib/june04/king/06king.html>

the journal and the speed of publishing. It is assumed, probably correctly, that research authors are only really interested in open access with concurrent publication in a commercial or learned society peer-reviewed publication.

The various models⁴⁶ that commercial publishers have tried include:

- Author pays, selects article to be open access, subscription income covers the non-open access articles (Derk Haank, Springer⁴⁷)
- Partial open access, author pays to make the article available, fee waiver to UK authors. OUP experiments with this model for one title in this experiment found a 25% open access take-up in this journal.⁴⁸
- Full open access. In OUP experiments the article were deposited simultaneously in PubMed Central. This resulted in a 10% increase in article submission rates, increase in article rejection rate, increase in full text downloads.⁴⁹
- Open access, author pays, but with different submission fee and publication fee (many journals with high rejection rates could not survive otherwise)
- Author may deposit in personal repository but there are restrictions on institutional repositories (Elsevier)

The RoMEO study⁵⁰ of claims for copyright ownership suggested that university authors might be best served in a system in which the universities asserted longterm rights but academics retained rights in the short-term. This might require reassessment of the role of publishers and their roles in adding value in the publication process. Most academics are concerned more with their moral rights than the property rights,⁵¹ and are unlikely to wish to exercise more rights in using papers than open access provisions would normally allow.⁵² The last⁵³ in the series of the RoMEO studies proposed Creative Commons licences and an Open Archives Initiative (OAI) compliant scheme for communicating rights metadata.

3.4.3 Other models of journal provision and access

Halliday and Oppenheim⁵⁴ include, in addition to the author pays-open access model the deconstructed journal, based around an Internet gateway of pointers to quality controlled resources referred to a subject focal points. The quality control organisations would need to be paid by the authors or their institutions for their roles in this transformation of the review process, but Halliday and Oppenheim point to flaws in the proposed ranking system. Another model proposes to pay referees for their work, in a system that charges both author and subscribers, but it is unclear how this would fit into commercial publishing as it stands, and whether paying for editing and reviewing papers would introduce bias that is not there at present.

⁴⁶ Gadd E, Oppenheim C, Proberts S. An analysis of journal publishers' copyright agreements. *Learned Publishing* 2003; 16(4): 293-308.

⁴⁷ Pearson S. UK Serials Group Annual Conference. *Ariadne* 2005 (43), <http://www.ariadne.ac.uk/issue43/uksg-rpt/>

⁴⁸ Pearson S. The UK Serials Group Annual Conference 2005. *Ariadne* 2005; (43), <http://www.ariadne.ac.uk/issue43/uksg2005-rpt> (Richardson)

⁴⁹ Pearson S. The UK Serials Group Annual Conference 2005. *Ariadne* 2005; (43), <http://www.ariadne.ac.uk/issue43/uksg2005-rpt> (Richardson)

⁵⁰ Gadd E, Oppenheim C, Proberts S. The impact of copyright ownership on academic self archiving. *Journal of Documentation* 2003; 59(3): 243-277.

⁵¹ Gadd E, Oppenheim C, Proberts S. How academics want to protect their open-access research papers. *Journal of Information Science* 2003; 29 (5): 333-356

⁵² Gadd E, Oppenheim C, Proberts S. How academics want to use open-access research papers. *Journal of Librarianship and Information Science* 2003; 35(3): 171-187.

⁵³ Gadd E, Oppenheim C, Proberts S. Rights metadata for open archiving. *Program* 2004; 38(1): 5-14

⁵⁴ Halliday L, Oppenheim C. Developments in digital journals. *Journal of Documentation*; 2001; 57 (2): 260-283.

SPARC (Scholarly Publishing and Academic Resources Coalition) is an alliance of (mainly) research libraries that has set up new journals in competition with journals with a high reputation, but whose subscription costs were crippling institutional library budgets. Prosser (of SPARC) contends that open access can compete successfully on quality and cost effectiveness for all four stages of the journal article lifecycle: registration, certification, awareness and accessibility and archiving.⁵⁵ The unknowns concern the effect on the academic reward structure, and how the funding will work as the open access model may benefit some learned societies (who suffer from the big deals at present) but the likelihood of big profits (that might drive further investment) seems low.

HighWire Press co-publishes and archives digital formats, establishing partnerships with journal publishers who are mostly not-for-profit.

3.4.4 Trends in usage and monitoring such trends

The NESLI2 analysis of usage statistics⁵⁶ aimed to provide the JISC Journals Working Group and its Negotiating Agent with accurate and up to date data on national use of journals available through the NESLI2 initiative (National e-journals). The main report findings are confidential. The summary report notes that for those libraries providing access to their e-journal collections through intermediary services provided by aggregators or gateways, and those usage statistics had to be added to the publishers' usage statistics. The researchers note the problems of finding the costs of print subscriptions, and the maintenance costs of print subscriptions were not always explicit. The overall cost of a deal was not always calculated in some libraries. Methodologically, doing this type of analysis appears difficult, and there are some hidden traps.

The trends in usage are perhaps unsurprising:

- Number of full text article requests in the large old universities in the A-B bands is considerably higher than for the other institutions. The number of subscribed titles is also larger, but as the costs are matched by higher usage, the average cost per request is similar to that of other institutions.
- No clear patterns of usage – sometimes the smaller libraries had lower costs but not necessarily lower use
- Number of requests increased in January-June 2004 compared to the same time period in 2003.
- A comparatively small percentage of title generated high usage across all institutions
- High use titles are predominantly those in the high or very high priced bands
- Titles in the scientific, technical and medical subject category are the most used overall.
- Costs of unsubscribed titles for each institution varied but generally were considerably below list prices
- Subscribed titles were used more heavily than unsubscribed titles across all institutions.

In summary, the changes in user behaviour are not remarkable, and publishers have got their pricing targeted correctly – the most costly journals are those are most valued by the customers. And to them that have, in terms of high popularity, shall more usage be attributed?

⁵⁵ Prosser DC. Fulfilling the promise of scholarly communication – a comparison between old and new access models. <http://eprints.rclis.org/ark:/00003918/>

⁵⁶ Conyers A, Dalton P. *NESLI2 analysis of usage statistics*. Birmingham: UCE evidence base research and evaluation, UCE library service, 2005 <http://www.ebase.uce.ac.uk>

3.5 E-library provision and services

3.5.1 Digital library development trends

In a report on digital library service development among American higher education institutions, Greenstein and Thorin⁵⁷ suggest that the maturing digital library abandons the “build it and they come” philosophy espoused in earlier collection development. Work concentrates on the policies, technological capacity (using a modular systems architecture, promoting common standards) and professional skills to sustain the digital library, by first re-assessing what users need, and how their behaviour, not just as users but as creators, is changing. They also suggest that the adult digital library is characterised by continued experimentation, interdependency with a wide range of organisations outside the organisation in which the digital library is itself based, and competing with other parts of their organisation for the right to control and co-ordinate institutional repositories, and negotiating how e-library provision can be linked to other activities within the organisation such as virtual learning environments (course management systems).

Although the emphasis in the report was on the American academic environment there are parallels in the development of e-library provision for the health sector in the UK. Questions need to be asked about:

- Interdependence of health e-library provision among the home countries
- Interdependence of the national e-library service with local print and e-library provision, and other library services such as promotion and training
- Links with other health sector activities – records of clinical care and codes of practice on managing NHS health records⁵⁸
- Links between the NHS and Higher Education on access to e-library resources, as users demand and expect a seamless service
- Integration of user support into educational activities at undergraduate, postgraduate and continuing education levels.

3.5.2 Emerging players in biomedical publication and archiving

Biomed Central is an independent commercial publisher that supports the objectives of PubMed Central. In March 2003 BioMed Central (BMC) signed an agreement with the NHS, so that NHS pays centrally for staff who wish to publish in a BMC publication, and NHS staff are being encouraged to develop NHS-led open access journals under the auspices of BMC⁵⁹. This model of open access may be suitable for a very active (and comparatively well funded) research community in the clinical and biomedical sciences. Biomed Central's publication charge may range from £300 to £900 (*stakeholder 18*). Other commercial and learned society publishers are less sure about its application to other disciplinary areas.⁶⁰ In effect, the NHS agreement means that there is no incentive for authors within the NHS to consider limiting their publication – and every reason for them to increase publication, or even start a new open access journal. One brake on this is the uncertainty about the perceived quality of open access journals, and the peer-

⁵⁷ Greenstein D, Thorin SE. *The digital library: a biography*. Washington: Digital Library Federation and Council on Library and Information Resources, 2002, <http://www.clir.org/pubs/abstract/pub109.pdf>

⁵⁸ DoH (England). *Records management: NHS code of practice. Consultation document*. Available from <http://www.dh.gov.uk/Consultations/> (August 2005)

⁵⁹ NeLH. National Core Content Press release from Biomed Central. http://www.nelh.nhs.uk/news_biomed.asp, accessed 18 August 04

⁶⁰ HC Science and Technology Committee Inquiry into Scientific Publications. Response from Blackwell Publishing Ltd. http://www.blackwellpublishing.com/doc/house_commons.doc, accessed 18 August 04

review processes involved. A small scale study⁶¹ in 2003 found that NHS staff were in favour in principle of using learned societies for their publication outlets, as opposed to commercial publishers. Their actual behaviour was rather different, with the journals named as essential reading, and high impact, reflecting the predominance of Elsevier Science, the main commercial publisher. Some of the open access approaches are innovatory, and BMC's review processes are far more transparent than in most traditional journals (with the review comments also openly available), but some authors may dispute whether this is a wholly desirable improvement. BMC has an evaluation literature awareness tool (Faculty of 100) – the Faculty are expected to review current journals in their field, pick out those worth reading and write a commentary on these (rather like the editors in the highly regarded clinical journals), but one difference is that they give the papers a rating – and the papers are from a variety of journals.

BMC is funded by Current Science,⁶² and is reputedly cushioned, like the Public Library of Science, by (in BMC's case) by the capital of its funder, or a multimillion dollar private grant (PLoS).⁶³ Not all the BMC content is open access – the Current Report Journals, Current Treatment are not. BMC offers a prepay membership option for publishing, an advance payment with 'loyalty discount' that kicks in when articles are actually processed and published.

Medical reference e-books are coming onstream now. Elsevier produces MDConsult, a collection of medical reference texts, plus the 'Clinics of North America' series, and some core journals such as The Lancet. In effect, this is a bit like an electronic version of the doctor's personal collection – a mix of books, core journals, and some practice guidelines, patient handouts.

3.5.3 Directions for health e-library services in Scotland

The **NHS Scotland** strategy⁶⁴ aims to provide a more equitable, and co-ordinated framework for delivery of knowledge services. The driving principle is that knowledge support should underpin all stages of the patient journey. The patient journey crosses back and forth from primary care to secondary and possibly tertiary care, and there is a strong emphasis in the NHS Scotland strategy on supporting the exchange of information in clinical networks. The NHS Scotland e-library provides a knowledge infrastructure, but to the translated into actions and decisions, support is necessary for the clinical networks and multi-disciplinary teams. The development themes for 2004-2007 are⁶⁵:

- Consolidation of e-library content (to include e-journals, e-books, Scottish executive policy documents with metadata incorporated directly into library structure, systematic reviews and guidelines, health and social care information websites (evaluated), selected RDN sites, and Health Scotland database of voluntary and support groups
- Development of cross-organisation knowledge networks

⁶¹ Morley P, Urquhart C. Publishing trends in medical journal literature: the views of medical staff in an NHS teaching hospital in the United Kingdom. *Health Information and Libraries Journal* 2004; 21(2): 121-124.

⁶² SQW Ltd for Wellcome Trust. *Economic analysis of scientific research publishing. A report commissioned by the Wellcome Trust*. London: Wellcome Trust, revised edition 2003, para 2.9.

⁶³ Olivieri R. Making a pig's ear of an unscientific free-for-all. *Times Higher Educational Supplement* 2005; 19 August, p.12.

⁶⁴ NHS Education for Scotland. *Exploiting the power of knowledge in NHS Scotland: a national strategy*. Edinburgh: NHS Education for Scotland, 2004, http://www.elib.scot.nhs.uk/news/documents/nhss_knowledge_strategy.pdf accessed 22 August 05

⁶⁵ Wales A. Managing knowledge to support the patient journey in NHS Scotland: strategic vision and practical reality. *Health Information and Libraries Journal* 2005; 22 (2): 83-95.

- Development of managed knowledge networks (subject-based knowledge portals)
- Provision of national and local information skills training and outreach programmes
- Training and development for the library workforce
- Development of a quality assurance framework for NHS Scotland Knowledge Services

The knowledge matrix⁶⁶ is based on the principles of building communities (participation by individuals) and managing knowledge resources to help create and maintain connections between different communities.

A preliminary analysis of user needs⁶⁷ based on 13 interviews with a variety of staff groups, identified that remote access would be welcomed, and that there was scope to integrate the information and knowledge resources with the patient record. Staff in non-clinical posts felt that the range of resources favoured clinical staff, and a need for a deeper level of information was indicated by all, to help in identifying trends for example. There was a need for reliable patient information. NHS library services should continue to develop promotion, but greater tailoring, alerting services, and help-desk support services could be developed. IT training, and greater information literacy were required and such training might best be delivered in small chunks, through e-learning. Knowledge management skills might be incorporated into Local Learning Plans. Attitudes and mindsets need to be changed to ensure that searching for the evidence is seen as an expectation of the daily routine, not an adjunct.

3.5.4 Directions for e-library development in Northern Ireland

The HONNI (Health on the Net Northern Ireland) service⁶⁸ is run by the Medical Library of Queens University Belfast, providing library and information services to Health, Personal Social Services and Public Safety staff in Northern Ireland. The HONNI service offers access to over 3000 electronic journals (some free), as well as a range of database services (BNI, Caredata, Chiddata, CINAHL, Cochrane Library, HMIC, MEDLINE, OTSeeker, PEDro, PsycInfo). The commercial e-journal providers are Proquest, EBSCO, and OVID. Different professional groups (medicine, nursing & midwifery, social work, pharmacy, health management, psychology, dentistry and allied health professions) can access a list of resources for them (usually arranged by databases, electronic journals, current awareness, subject gateways, guidelines, professional organisations, and other organisational websites).

3.5.5 Directions for National Library for Health (England)

The **English NHS Library Policy review**⁶⁹ recommended that the national leadership of NHS Libraries should be clarified, and that national library services should be co-ordinated with local services. In particular, planning and liaison of the interface might occur at the strategic health authority/workforce development confederation level. The report points out that library services, as presently configured, reach only a minority of NHS staff, and that electronic service delivery needs to be optimised. The implications are

- Local services to act as ambassadors for national e-services
- Reduced focus on collection building at local level

⁶⁶ Wales A. *From knowing to doing transforming knowledge into practice in NHS Scotland. Draft for consultation.* April 2005. Edinburgh: NHS Education for Scotland.

⁶⁷ Burnett S, Webster L, Williams D. *The nature of future strategy for library and knowledge services for NHS Scotland: a preliminary analysis of user needs.* Aberdeen: Robert Gordon University Centre for Knowledge Management, 2005.

⁶⁸ HONNI services. <http://www.honni.qub.ac.uk/Services/>

⁶⁹ Herman C, Ward S. *The NHS Library Policy Review – developing the strategic roadmap. A report by TFPL Ltd.* London: TFPL Ltd, 2004.

- More emphasis on learning and interaction – libraries more in learning and meeting centre mode
- More emphasis on multidisciplinary teams among library staff
- The **User Needs Analysis**⁷⁰ involved desk research, stakeholder interviews, and a web questionnaire.

The desk research involved an overview of previous needs surveys (n=55) conducted or commissioned by health librarians since 2000. Most surveys had covered clinical staff, with nurses leading the list, but only five surveys had covered hotels, property and estates and only two surveys had included support to ambulance staff. Many of the findings focused on the barriers to use such as:

- Lack of awareness, compounded by confusion over entitlement to services
- Lack of protected time for study – using information services is not regarded or deemed to be 'working time' well spent.
- Perceived lack of skills and confidence
- Physical barriers – poor IT infrastructure, connections, passwords
- Remoteness of libraries from workplace

The consultation process obtained input from around 3,700 NHS staff in England (around 0.25%, of 1,400,000 staff).

A pilot survey explored not just the questions that might be useful for the larger online survey but also the perceptions of groups of staff whose needs have not been well defined in recent surveys, or whose needs are likely to be changing. Interviews (personal and group interviews) were conducted in a range of strategic health authority settings (largely urban non-London, largely rural, and a London SHA), focussing on the following user groups: health care assistants, junior doctors and senior managers (i.e. department heads rather than team leaders). In total, views were obtained from 109 people, but the number of junior doctors in the survey was (unsurprisingly) low (n=7). Findings showed differences among subgroups within these staff groups. For example, managers with a health professional background have different information behaviour from career managers (reflecting older research⁷¹ findings). Access to IT at work (or lack of it) does not necessarily affect IT literacy as some health care assistants (for example) search the Internet successfully at home. Health care assistants' needs were dominated by NVQ requirements.

The online questionnaire was accompanied by local publicity through CHAIN, and librarian based e-mail discussion groups. The online questionnaire was posted for four weeks over April 2005, and made available through a link on the NHS gateway home page. After removing responses that had not noted an English SHA for their workplace, and the duplicate responses, 3510 responses were obtained.

The main findings on the **type of information** required were that:

- Background information – in articles, books, research reports - was often required, particularly by clinical staff
- GPs, in particular, and other doctors looked for digests and summaries
- Doctors wanted information on treatment options

⁷⁰ Lindsay D, Ward S, Winterman V. *NHS Staff User Survey*. London: TFPL Ltd, 2005.

⁷¹ Head A. An examination of the implication for NHS information providers of staff transferring from functional to managerial roles. Aberystwyth: UWA unpublished Master's dissertation, 1996.

- Managers (clinical and non clinical) wanted information on performance measures
- All groups of staff wanted statistical information, official guidance and policy, regulations, and information on training opportunities
- All staff, but particularly the support staff, wanted contact information

The results indicated that the range of information needs was similar among staff groups, but clinical managers, allied health professionals, other professional staff, doctors and nurses, had more needs than other staff groups. The interviews indicated that alerting services were valued and that pathways through guidance material were required (of various types, depending on the staff). Managers expressed an interest in finding out about practices in other trusts. A wide range of sources is used, but the popular resources are an Internet search, database (e.g. MEDLINE) search, electronic journals, NHS libraries, the Department of Health website, and paper journals.

Perceptions of the information available to them included:

- Insufficient e-content – journals and books, and expectation that finding an abstract will mean that a full text article is a click away
- Professional organisations fill many of the gaps for some staff groups at both local and national level. Online communities perceived to be helpful
- Difficulty of finding out about projects being undertaken elsewhere
- Google and Amazon much easier to search than the National Library for Health
- Shared access to computers is a barrier to use, and home use is expensive.

Respondents generally agreed that the processes associated with document delivery could be simplified, and that library staff skills may be better used in enquiry services or in filtering, and tailoring information. Over 60% of respondents always prefer to search electronically, 43.3% sometimes prefer to search manually for printed items. Views on reading on screen or on paper are equivocal, but nearly half sometimes prefer to save on paper. Similarly, views on sharing information electronically or in print seem to be shifting, as 27% always prefer to share electronically, but 46.7% sometimes prefer to share in print, and 34.4% sometimes prefer to share electronically. Information should be obtained quickly, and should be easy to use, and easy to access. Not surprisingly electronic access to materials was valued. Over 75% of respondents indicated that they were willing to order articles online without library staff support, and a similar percentage thought that the delivery of electronic articles over the Internet would be valuable.

Responses on the use of particular services indicated a lack of awareness of many of the digests of evidence and summaries, the news alerts that could be of interest, although respondents may be using these, unaware of the exact title. The list in the questionnaire was very long and it is possible that respondents simply ticked the resources they know and use very regularly. However, it is interesting to note that Bandolier, a user friendly guide to evidence based practice developments, is used frequently by 5%, sometimes by just over 25%, 20% never use it, just under 30% were unaware of it, and just under 20% did not respond. Just under 50% were unaware of the Guidelines finder.

The findings confirmed that many were ignorant of the services already provided for them, and that workplace culture was part of the 'time constraints' problem. There was strong support for e-library development and national procurement if these made access to a wider range of resources, including non-clinical resources, easier.

The following areas were identified for extension and improvement in electronic access:

- E-journals, investing in electronic delivery and training in use of e-journals, and extending coverage in the subject areas required by non-clinical groups

- Improving accessibility – simpler navigation with a 'Google' type search engine, and more personalisation (as already planned)
- Prioritisation of specific content needs and implementation of a content development model (the report recommends that resource sets are trialled carefully with a small group of the relevant staff group plus LIS staff)
- Developing a range of information skills programmes, tailored to the profile of needs for particular groups (and more promotion of resources).

3.5.6 RCN survey findings

The **RCN survey**⁷², based on return from 1715 completed questionnaires, noted regional variations in general access to information. Accessing computers and the Internet at work was reported to be low in Wales, but this may be attributed to the higher number of students and health care assistants in the sample from Wales. Awareness of professional organisations and their websites was higher than other websites aimed at health staff. For example, over 40% of respondents had seen the RCN website, 38.3% of RCN members used it regularly, and 15.5% of RCN members used the RCN Learning Zone. Only 12.2% of respondents had seen the NMAP website and fewer than 5% used it regularly. Comparing the home countries:

- 23.1% of respondents working in Scotland had seen the e-library website and 29% had both seen it and used it regularly
- 14.6% of respondents working in Northern Ireland had seen the HONNI website and 17.5% had both seen it and used it regularly
- 15% of respondents working in Wales had seen the HOWIS website and 19.6% had both seen it and used it regularly.

Generally, there was slighter higher usage of the policy document site than the corresponding 'knowledge and learning' sites for the home countries.

Full text provision is popular – 40% of respondents always wanted to get more full text articles from the Internet from a larger number of journals, and 31% said they sometimes required such access. Results also indicated how the work culture affects attitudes towards searching for the evidence. Those respondents who were encouraged to search for the evidence in working hours were also more willing to continue searching in their own time. Changing practice may require the entire package: good technical infrastructure and access to the Internet, supportive library and more support at work.

The main resources identified as 'very useful' for completing an assignment were journal articles or reports (79.3% of respondents), books (57.4%), electronic databases (CINAHL etc) (51.9%) and local health library (47%). For keeping up to date, journal articles or reports again predominate (76% of respondents), but next come websites on the Internet (46.5%) documents and publications from own organisation (43.3%), and then other formal and informal resources such as colleagues, electronic databases, RCN resources and the local health library.

3.6 Identifying core journals

The contribution of various journals to answering the questions that arise in a particular disciplinary area can usually be described in terms of the Bradford Law. If the journals are ranked in terms of productivity, and divided into three groups of equal contribution, then the ratio of the number of journals in each group is usually $a:an:an^2$, i.e. a small core group, a larger middle group, and a much larger and generally less productive outer group.

⁷² Royal College of Nursing. *Report of key findings of RCN's survey of the information needs of nurses, health care assistants, midwives and health visitors*. London: RCN, April 2005.

The esteem or worth of a journal can be estimated in several ways. For the research community the most relevant estimation is by impact factor, and that is a measure of the number of times articles in that journal are cited by other authors. The measure depends on the years covered, the number of years covered, and adjustments have to be made for the number of issues and articles. Depending on the rate of change in the disciplinary knowledge base, the 'half life' of a journal article may differ.

The ISI journal citation reports group the impact factors for various disciplinary areas. We have examined the reports for the following subject areas, focusing more on the nursing, allied health, and cross disciplinary subject groups, although the groupings are not particularly helpful in identifying the core journals for some allied health disciplines. The number of journals in each subject category varies considerably. In pharmacy and pharmacology, for example, there are 187 journals that can be ranked by ISI, whereas in nursing there are 33. Pharmacology research is very active, and there is a greater volume of publication, as the highest impact factor (22.8) also suggests.

The subject categories examined for the 2004 JCR science editions were:

- geriatrics and gerontology
- health care sciences and services
- medical laboratory technology
- nursing
- nutrition and dietetics
- ophthalmology
- pharmacology and pharmacy
- orthopaedics
- pathology
- rehabilitation
- substance abuse

These subject areas are often the responsibility of multidisciplinary teams, or professional areas not traditionally covered by postgraduate medical libraries. For those groups, the first ten (by impact factor for the 2004 JCR) were categorised by publisher, with the exception of the nursing group (first 15 journals categorised) and substance abuse (only 8 in the group). The results (full list in Appendix 4) confirm the dominance of Elsevier (19 journals) and Lippincott (16 journals). American learned societies usually contribute at least one journal to the top ten journals in a subject category. The table also notes the stated country/coverage for the publishers based in more than one country.

3.7 NHS-HE collaboration, joint purchasing and training provision

'In these days of wireless networks and home working there is still great frustration among medical, nursing and allied professions and clinical teachers and researchers that there is not seamless access between the NHS network and systems and those of the universities – namely between NHSnet and the JANET (Joint Academic Network) which is managed by the UK Education and Research Networking Association (UKERNA).'⁷³

The NHS-HE forum was formed in 2001, and continues to develop and support initiatives such as an agreed NHS-HE connectivity model using a client-server approach, the sharing of best practice in connectivity (Teague ⁷⁴) cites the All Wales Network as well as

⁷³ Teague M. The NHS-Higher Education connectivity project. *British Journal of Healthcare Computing and Information Management* 2005; 22 (7): 20-22.

⁷⁴ Teague, above reference

Addenbrookes), and the Thornhill⁷⁵ report which examined the sharing of content across HE and the NHS.

The plans for the National Programme (Connecting for Health) in England include:

- N3 broadband network for the NHS will have a gateway to JANET.
- Security model to be more application specific. This should allow access requirements to library and knowledge service to be different from those for clinical systems
- NHS staff smartcard to be used as an authentication mechanism.

For undergraduate clinical students who have qualified in the Wales and become pre-registration house officers, passwords are carried over, together with access to the JANET network and as such this group are considered as 'university students' with rights of access to university networks. Other staff groups with this type of access include the specialty registrars, and the Deanery pays for access to the university network for this group, and that gives them greater access to electronic journals. The medical staff groups without this type of dual access include the SHOs, staff grades, and doctors not formally in training posts. Similarly, nurses who are in pre-registration or post-registration education have access to the university networks within Trusts, as well as within the universities themselves. Wales has a size advantage for NHS-HE collaboration as English HE procurement is more diverse.

'On the HE side there isn't a tradition of national purchase. Purchasing tends to be devolved to the local level, the individual institution and sometimes institutions come together in smaller consortiums. So the JISC's role often as a negotiating body, we'll negotiate so that individual institutions opt into, rather than we buy on behalf of all of them.' (stakeholder 3)

Increasingly the University networks (within the NHS Trusts) are supporting not simply access to resources but access to resources within an e-learning framework, for CPD to be delivered when and where required.

'I think that we have some fantastic developments going on certainly given the rurality of Wales in terms of distance learning, e-learning, interactive packages' (stakeholder 1)

Use of such packages can be monitored, to examine how effective they are, which is sensible given the high costs of developing effective e-learning packages. But getting the NHS-HE connection is important for further development of the HOWIS e-library as:

'it would have a great relevance to use in CPD rather than in access to up-to-date information to support practice...because most people will use the RCN website, EMAP learning website or whatever else they belong to. That's just the way they go.' (stakeholder 1)

Views from other professions confirm that supporting learning is a good idea, and that the NHS should be helping the staff not eligible for access to university networks to access the type of learning materials that are being produced by a variety of publishers – the clinical learned society publishers, commercial publishers, and other ventures such as Oneexamination.com. This is a new area and there are few approved business models for such ventures. Some postgraduate deans are rolling out VLEs (virtual learning environments) for all the post-registration training grade doctors within their areas, but that will require 24/7 technical support given the likely times of day and night staff may be using such VLEs.

⁷⁵ Thornhill J. Users first. London: Thornhill Consultants, 2003.
<http://www.ucl.ac.uk/Library/usersfirst.pdf>

'Nationally you can see some developments now of really good e-learning materials through some commercial companies. For examples, BMJ Learning...they have all of their learning materials peer-reviewed, equally the Doctors.net...that also provides a great deal of learning materials, quite user-friendly, you get certification at the end of what you've done...Oneexamination.com provide online tests, examination for people who are thinking of taking a professional qualification for the membership of the Royal College of Physicians...extremely good site but it does cost. There are bulk purchase options available to NHS Trust but the difficulty...we have to be equitable...difficult when you're placing a contract using public money with a single provider.' (stakeholder 2)

For collaborative purchasing this may – or may not – lead to some divergence in priorities between NHS and HE, complicated by the diversity of views from those who traditionally have undertaken some, or all of their own procurement.

'You've got people like the National Knowledge Service, the Core Content group, and that's not to mention the local organisations...so that makes it a very complex landscape, and also that that...there seems to be an ongoing administrative change with the health service...therefore the person who on one day might have been the correct person to talk to, the next day they weren't...

...sometimes almost competing visions of what people should be doing. The value of research material, medical research material may be different in the higher education sector...who's going to pay for what content...When is something worth more the health service side than it is for the education side and vice versa.' (stakeholder 3)

Examples of good practice of NHS-HE collaboration that supported use of HOWIS and e-library resources were:

- Access to NHS courses such as ECDL for training grade doctors (in some Trusts such medical staff are not eligible for Trust-provided courses)

This saves staff time in the long run as:

'many of the doctors who use computers don't have good keyboard skills...so they're hunting and pecking with two fingers on the keyboard putting in clinical notes which is a problem....'

And patient expectations and trust are important:

'because the patient really thinks that the doctor who is not computer literate is not able to use the tools of their trade effectively, not different from not being able to use a stethoscope.' (stakeholder 2)

Around 2001 the Joint Academic Network (JANET) was extended to further education colleges. To support further education colleges, the JISC (Joint Information Systems Committee) established regional support centres (RSCs). RSC Wales, like the other RSCs aims to help colleges make full use of the services and resources now available to the colleges, and supports teaching staff in developing e-learning. In Wales, the RSC team is based in four locations.⁷⁶ The RSC site lists resources under various categories, one being health and social care. This list (arranged alphabetically) includes more general resources such as BBC Learning, Teacher Resource Exchange, as well as organisational site resources (e.g. Boots Learning Store, Joseph Rowntree Foundation) and sites that offer access to a wide range of quality resources (NMAP, NHS Direct Online). Some Welsh resources are listed, such as Children First. The list also includes several tutorials such as 'Internet for Health and Social Care' produced for FE vocational curriculum areas, or first year undergraduate students (e.g. Internet Psychologist) by the RDN Virtual Training Suite team. The RSC Verification report for 2004/2005 (available from the RSC

⁷⁶ Regional Support Centre Wales Information Portal. <http://www.rsc-wales.ac.uk/aboutus.asp> (accessed 13 Nov 05)

Wales website) notes that the performance of RSC Wales is exemplary, including the area of activity of 'working in partnership'.

In Scotland, a project funded by JISC through the JISC 'Exchange for Learning' programme (X4L) was a collaborative venture involving HE (Napier and Heriot-Watt) and FE (Lauder College, Telford College) and the Royal National College for the Blind. The aim was to 'repurpose' material, so that it could be integrated into different teaching and learning activities, and tailored to meet the different educational needs of students working at different levels and for different professions. The intention is to deposit these resources into a new digital repository (JORUM). Resource repurposing (for IPR and budget restraints) was limited to levelling (using the same diagrams, graphics, but editing supporting text), aggregation (grouping of resources) and enhancement (e.g. adding quizzes).⁷⁷

Joint purchasing (NHS/HE/FE) is more problematic and the difficulties cited included:

- Co-ordinating timescales on existing deals (*stakeholder 15*)
- Different priorities of the academic researcher and the practitioner (*stakeholder 14*)
- Co-ordinating information about existing print subscriptions in different NHS Trusts (to use when negotiating on bundled deals)
- Deciding on a fair basis of usage (realistic pricing of usage, and a realistic price per concurrent user, given the different usage profiles in NHS, HE, FE)
- Assessing user needs when the users themselves are not sure and there is no benchmark for expected usage (*stakeholder 15*)

⁷⁷ Comrie A. Learning for healthier nation. *Health Information and Libraries Journal* 2005; 22 (3): 232-234 (also <http://extranet.lauder.ac.uk/x4L>)

4 User needs in Wales

Section 4 presents the results of the surveys, including the online surveys (Internet and Intranet, and the questionnaire survey).

4.1 Reasons for using HOWIS

The main reasons for using HOWIS (Table 4) were for CPD (around 40%), personal research and individual patient care. Many (around a third) of those completing the Intranet survey left this section blank. The frequency distributions for the online and postal questionnaire surveys were comparable with the exception of the proportion of CPD use (55.6% of questionnaire respondents compared to 32.2% of online respondents), updating (26.7% of questionnaire respondents compared to 15.5% of online respondents).

From the clinical governance perspective, the results indicate that HOWIS fulfils an important role as nearly one in five of respondents were using HOWIS for clinical governance or guidelines, and a similar proportion was using HOWIS for updating.

Reasons for using HOWIS	Intranet (online) n=363	Internet (online) n=115	Sub-total (online) n=478	% of online	Quest. n=225	% of Quest.	Total	% of total n=703
Continuing professional development	122	32	154	32.2	125	55.6	279	39.7
Teaching	36	16	52	10.9	31	13.8	83	11.8
Patient care - individual	50	55	105	22.0	55	24.4	160	22.8
Research - funded	31	4	35	7.3	19	8.4	54	7.7
Research - personal	76	28	104	21.8	64	28.4	168	23.9
Legal/ethical issues	26	4	30	6.3	12	5.3	42	6.0
Updating	59	15	74	15.5	60	26.7	134	19.1
Clinical governance/ guideline dev	71	12	83	17.4	49	21.8	132	18.8
Patient care - service dev	26	14	40	8.4	28	12.4	68	9.7
Audit	24	11	35	7.3	21	9.3	56	8.0
Other - not specified	71	9	80	16.7	32	14.2	112	15.9
No answer(Blanks)	122	23	145	30.3	18	8.0	163	23.2

Table 4 Reasons for using HOWIS

Within the category of CPD, similar themes emerged from the comments made on the questionnaire (although 37.1%, 261/703 did not provide details of the query). It was difficult to assess the main aspect required from the limited nature of the comments, and the categorisation below is approximate. For ease of comparison, figures are rounded to the nearest five.

Respondents expected to find details of **job vacancies**, as well as details about **short courses**, and **current news about HR policies**.

“Vacancies available, Agenda for Change update”

"Checking for job vacancies within other Trusts around Wales"

"Information on medium term/long term ECDL training"

"Papers for an upcoming exam" (30 similar comments)

On patient care planning several respondents mentioned **health promotion** issues:

"smoking cessation"

"health promotion issues in relation to testicular cancers"

"user involvement" (10 similar comments)

A larger number of respondents wanted **specific clinical advice or information**, including information on **specific drugs**:

"malaria prophylaxis via TRAVAX"

"renal failure in diabetics"

"information on an unusual lymphoma"

"dose of Tazocin for neonate" (45 similar comments

..... and 5 comments on audit)

Another large category indicated that their enquiry was on **clinical governance**:

"PEG feeding guidelines"

"nurse-led clinics" (65 similar comments)

Others wished to check for **recent policy documents**, with several specifically mentioning that they wished to find the **Assembly** response to some English policy documents. From the limited comments it was occasionally extremely difficult to distinguish the corporate from clinical governance aspect of the enquiry.

"Accessing WAG consultation document on formation of Workforce Development, Education and Commissioning Unit within the National Leadership and Innovation Agency for Healthcare" (15 similar comments)

Other respondents were seeking **contact** information:

"To find sources of charitable monies to facilitate the purchase of specialist equipment for children with mild-severe disabilities."

"GP address required" (15 similar comments)

Just over 2% of the respondents commented that they had **not heard of HOWIS** and that this was their first visit:

"I have never looked on the HOWIS website before"..... (5 similar comments)

Reasons for not using HOWIS, apart from lack of awareness, were identified in some of the interviews. These include habit, and habitual use of professional networks, preferences for networks used in undergraduate education where a more relaxed approach is adopted to using the network for purposes that are both personal as well as professional. Restricting personal use of the Internet may deter some groups of staff from using HOWIS.

'[name of group] tend to use the professional networks for any electronic information so that if they belong to [name] there is a very good website including a website that is around advancing their practice.' (stakeholder 1)

'Some trusts also block access to [staff] from sites which allow them to order [name] textbooks which we find very curious...nobody in the Trust can order

anything to be delivered to the hospitals...and if somebody for example comes from Pakistan they might want to occasionally look at the website of the newspaper of their homeland – and again, they're banned from doing that in some Trusts. But in other Trusts...where there is a very reasonable policy, that they allow a certain number of minute of personal use per day on the Internet which is perfectly reasonable.' (stakeholder 2)

4.2 Resources used

4.2.1 Resources used on HOWIS

The main resources on HOWIS (Table 5) reflect the predominance of MEDLINE as a clinical database, although the number of blank responses to all sections by intranet respondents suggest that many respondents cannot remember what they used on a previous occasion (or perhaps they are first time, or infrequent users). Among the specific evidence-based resources, Cochrane, Bandolier and Clinical Evidence appear to have greater name recognition than OVID's EBM Reviews.

There are differences between the online and questionnaire respondents concerning the extent to which particular knowledgebases were used, although the order of popularity is similar. This could be attributed to the different distribution of staff groups in the sample, the online group being dominated by pharmacists.

Resources used on HOWIS	Intranet (online) n=363	Internet (online) n=115	Sub-total (online) n=478	% of online	Quest. n=225	% of Quest.	Total	% of total n=703
AMED	24	11	35	7.3	33	14.7	68	9.7
BNI	25	4	29	6.1	28	12.4	57	8.1
CINAHL	61	11	72	15.1	87	38.7	159	22.6
EBM	13	20	33	6.9	6	2.7	39	5.5
HMIC	14	5	19	4.0	4	1.8	23	3.3
MEDLINE	120	67	187	39.1	113	50.2	300	42.7
PsychINFO	17	8	25	5.2	16	7.1	41	5.8
EMBASE	32	37	69	14.4	14	6.2	83	11.8
<i>Blank responses (OVID databases)</i>	<i>221</i>	<i>45</i>	<i>266</i>	<i>55.6</i>	<i>0</i>	<i>0.0</i>	266	37.8
Bandolier	34	33	67	14.0	18	8.0	85	12.1
Clinical evidence	27	36	63	13.2	14	6.2	77	11.0
Cochrane library	63	46	109	22.8	65	28.9	174	24.8
Doctor online	9	8	17	3.6	4	1.8	21	3.0
Effective healthcare bulletins	27	12	39	8.2	10	4.4	49	7.0
Effectiveness matters	13	7	20	4.2	6	2.7	26	3.7
Health evidence bulletins Wales	27	14	41	8.6	17	7.6	58	8.3
<i>Blank responses (Evidence based)</i>	<i>258</i>	<i>55</i>	<i>313</i>	<i>65.5</i>	<i>1</i>	<i>0.4</i>	314	44.7
ASSIA	4	2	6	1.3	2	0.9	8	1.1
WeBNF	10	38	48	10.0	1	0.4	49	7.0
Caredata	1	3	4	0.8	0	0.0	4	0.6
<i>Blank responses (other databases)</i>	<i>347</i>	<i>77</i>	<i>424</i>	<i>88.7</i>	<i>1</i>	<i>0.4</i>	425	60.5
Oxford textbooks	17	15	32	6.7	10	4.4	42	6.0
BMJ collections	56	41	97	20.3	41	18.2	138	19.6
Emerald full text	12	7	19	4.0	5	2.2	24	3.4
<i>Blank responses e-ref, e-journals</i>	<i>295</i>	<i>70</i>	<i>365</i>	<i>76.4</i>	<i>1</i>	<i>0.4</i>	366	52.1
NICE	99	49	148	31.0	98	43.6	246	35.0
E-guidelines	20	25	45	9.4	5	2.2	50	7.1
SIGN	23	38	61	12.8	13	5.8	74	10.5
UK blood transfusion & tissue	4	2	6	1.3	5	2.2	11	1.6
Transplantation guidelines	1	1	2	0.4	0	0.0	2	0.3
<i>Blank responses, guidelines</i>	<i>257</i>	<i>61</i>	<i>318</i>	<i>66.5</i>	<i>43</i>	<i>19.1</i>	361	51.4

Table 5 Resources used on HOWIS

The survey results indicate that awareness of some resources seems lower than might be predicted for the target audience. For example:

- Use of Caredata is very low, compared to usage of other resources used by nurses (BNI, CINAHL)
- Use of ASSIA is low, as it might be expected that allied health professionals and nurses would have at least an occasional need to consult this.

- Use of HMIC, and Emerald full text (about 3%) is low compared to proportion of managers and administration staff in the sample (17.5%, 123/703))
- Usage of Oxford textbooks (6%) is low compared to the proportion of medical staff in the sample (13.5%, 95/703)

4.2.2 Other resources used

Turning to other resources that were used to help with the query, Table 6 indicates personal collections (books and journals) are valued, but that the Internet (and search engine use) is very much part of the 'personal collection' of resources. The next layer of professional resources, colleagues, library staff, are also important.

Resource	Intranet (online) n=363	Internet (online) n=115	Sub- total (online) n=478	% of online	Quest. n=225	% of Quest.	Total	% of total n=703
Books - personal	81	40	121	25.3	104	46.2	225	32.0
Journals - personal	82	33	115	24.1	105	46.7	220	31.3
Colleagues	71	43	114	23.8	67	29.8	181	25.7
Library staff	58	8	66	13.8	83	36.9	149	21.2
Resources via personal prof membership	55	24	79	16.5	62	27.6	141	20.1
NHS library resources - paper	47	11	58	12.1	50	22.2	108	15.4
Own NHS library - electronic	39	19	58	12.1	43	19.1	101	14.4
Internet search	134	56	190	39.7	112	49.8	302	43.0
PubMed	54	20	74	15.5	45	20.0	119	16.9
Other - not specified	20	20	40	8.4	12	5.3	52	7.4

Table 6 Other resources (non HOWIS) used to answer query

The online responses differ from the questionnaire responses in several ways. First, the questionnaire respondents are generally inclined to use more resources to answer the query, suggesting that the question being considered is more complex, or more important than the questions online users usually attempt to answer using HOWIS. There are significant differences between the two groups (using a chi-squared test) in the use of books, or resources available via personal professional membership, or use of NHS library resources. The main differences between the groups' composition are the preponderance of pharmacists in the online group, and the larger than target representation of allied health professionals in the questionnaire returns. If the allied health professionals, and the nurses, use the services of their professional group more than the pharmacists do, then that might explain part of the differences. As for use of NHS library resources, it seems possible that although the postal questionnaire respondents were targeted randomly, frequent library users were more likely to return forms than the infrequent library users.

The success rates of the respondents to both surveys are comparable, if the missing responses are excluded from the calculation. Over 75% of both groups were successful. Excluding the missing responses, 76% (217/285) of the online searchers were successful, and 83.6% (174/208) of the questionnaire respondents were successful in their search.

Less than 5% claimed they were not successful. More respondents in the online survey, compared to the postal survey (40.2% compared to 7.1%) did not complete this question.

4.2.4 Comparison with usage statistics

Usage statistics obtained from Health Solutions Wales provide further details of the order of usage, although the way in which the databases are divided up for usage reporting makes comparison of like with like impossible.

The OVID usage statistics for January-June 2005 (searches, Figure 2, and sessions, Figure 3) indicate the following order of popularity of use for searches:

1. MEDLINE Most popular (by far)
2. CINAHL
3. EMBASE
4. BNI
5. PsychINFO
6. EBM Reviews (various)
7. HMIC
8. AMED
9. Journals @ OVID
10. Books @ OVID

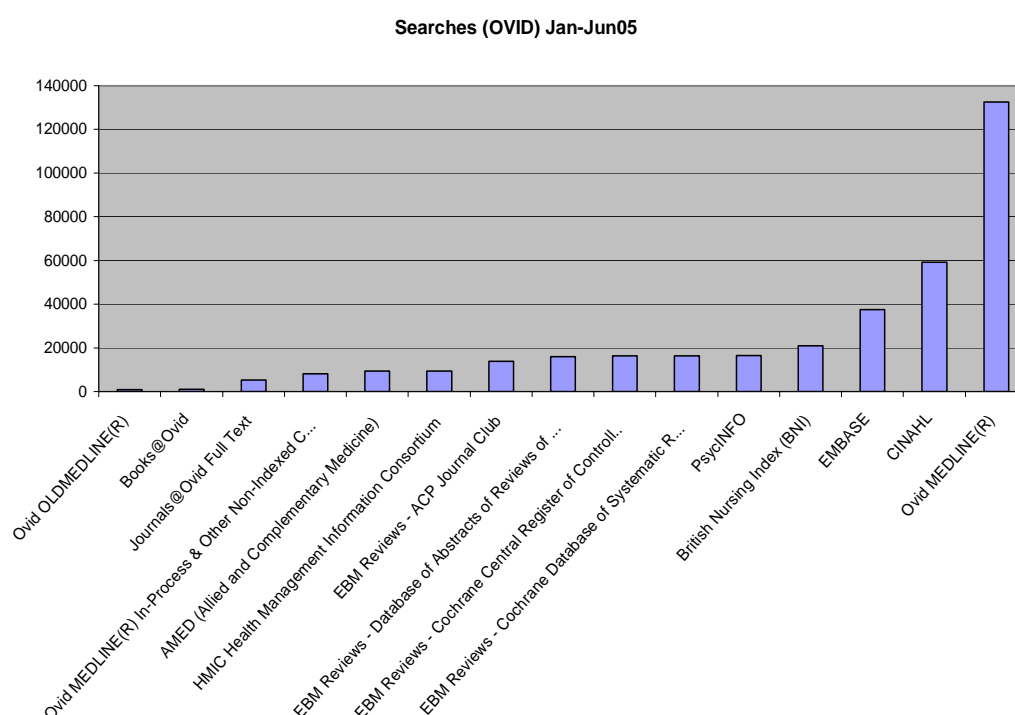


Figure 2 OVID searches January – June 2005

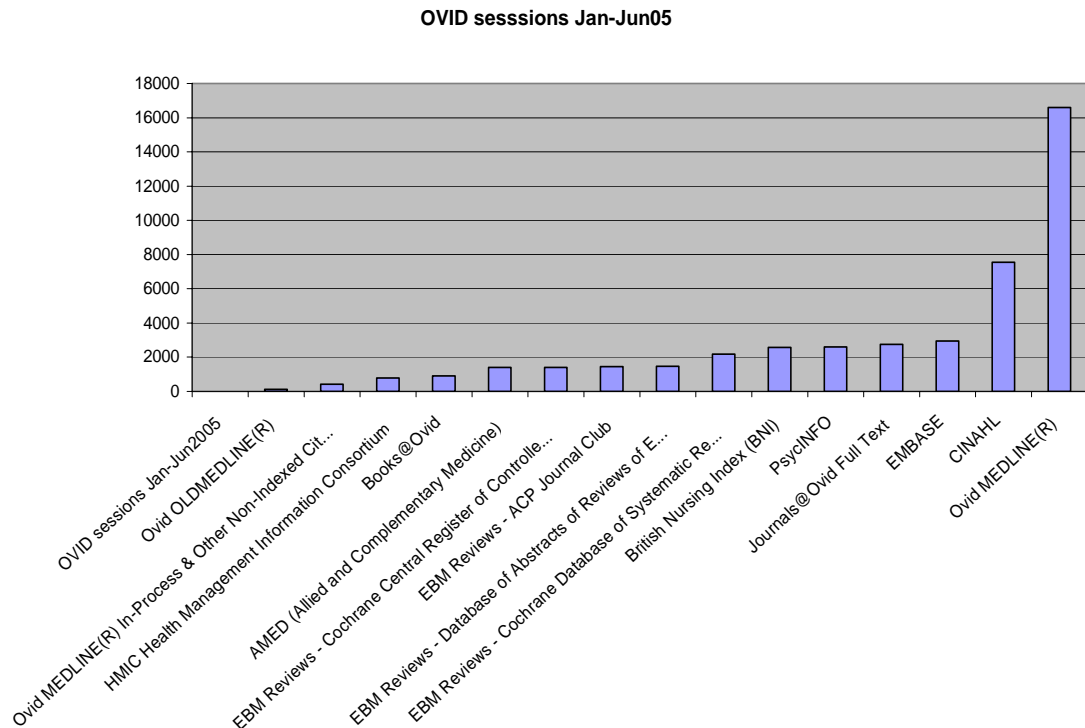


Figure 3 OVID sessions January to June 2005

The rank order for sessions is slightly different, the main difference being the higher rank for the full text journals (4th rather than 9th)

1. MEDLINE
2. CINAHL
3. EMBASE
4. Journals @ OVID
5. PsychINFO
6. BNI
7. EBM Reviews
8. AMED
9. Books @ OVID
10. HMIC

The Athens statistics (Figure 4) provide further details about the comparative popularity of other knowledgebases, but the figures need to be interpreted with caution as several of the knowledgebase accesses come from one or two administrator sites only for any particular month. The Athens statistics do not, of course, include the Intranet usage figures. Full-text journals are being searched from home, apparently.

The survey findings asking about a recent search ranked the popularity of resources as follows.

1. MEDLINE
2. NICE
3. Cochrane Library
4. CINAHL
5. BMJ Collections
6. Bandolier, EMBASE, Clinical Evidence, AMED, BNI, HEBW, Effective Healthcare Bulletins, WeBNF, PsychINFO, SIGN
7. Emerald Fulltext

There are some differences between the survey's ranking and the usage statistics rankings. For example:

- It is possible that some Cochrane Library searches within EBM reviews are recognised primarily by the users as 'Cochrane Library'
- Emerald full-text searches appear more popular than the survey indicates – perhaps most of these are being conducted at home, and the survey respondents focused more on a search that was purely clinically relevant
- Users may remember some knowledgebases or guideline collections more easily than others – there is a brand recognition factor to be considered?

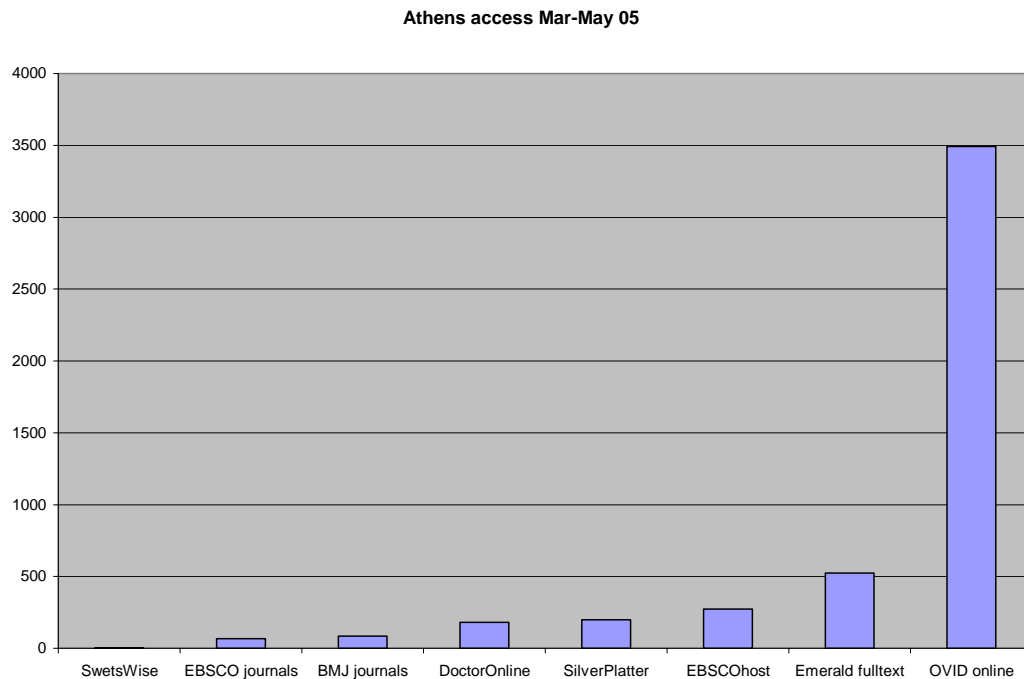


Figure 4 Athens accesses Mar-May 2005

4.3 Obtaining resources for specific purposes

4.3.1 Ease of obtaining information for specific purposes

For the calculations, the questionnaire responses have been combined with the online survey responses, as the profiles were similar.

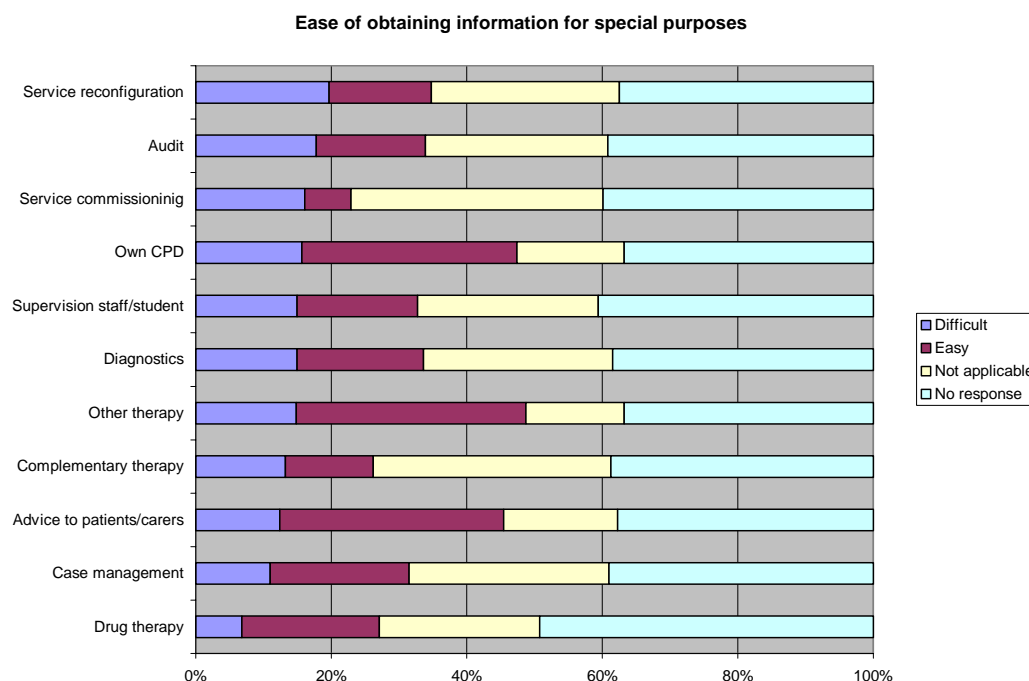


Figure 4 Ease of obtaining information for specific purposes

Figure 4 indicates that many staff have little problem in locating information for their own CPD, or for the advice or information provided to patients or carers, or therapy-related queries. The main areas that few staff found easy are service commissioning and complementary therapy though these are also areas where many thought the need was not applicable for them. Interestingly, although a high proportion of staff found information for their own CPD easy to find, a sizeable proportion found it difficult to obtain. The purposes posing most difficulty were service reconfiguration, service commissioning, audit and own CPD. A high number of respondents (mainly pharmacists on the Internet survey) did not respond to the drug therapy part of the question.

4.3.2 Perceived training needs

Over half of all respondents thought they would gain from advanced training in searching and critical appraisal (and the figure is higher if missing responses are excluded from the calculations). A higher percentage of the questionnaire respondents had done a training course than the online respondents (Table 7) but the difference disappears if the missing responses are excluded from the calculations and the percentages calculated accordingly, in which case around 30% of both groups have done a basic training (90/294, 59/195). Similarly, for advanced training in searching and appraisal, 15% (43/286 of respondents completing the question) of online respondents indicated they had done an advanced course, and 12% (23/188) of questionnaire respondents indicated they had done a course.

The perceived training needs, particularly among primary care staff, may underestimate the extent of the training needs. A 2001/2002 questionnaire survey⁷⁸ (with, admittedly, low response rate for the two sites, 24% and 34%) of primary care staff in Nottingham and Rotherham indicates that usage of the Internet was higher than usage of knowledgebases, and GPs and practice managers were infrequent users of libraries.

⁷⁸ Doney L, Barlow H, West J. Use of libraries and electronic information resources by primary care staff: outcomes from a survey. *Health Information and Libraries Journal* 2005; 22(3): 182-188.

A recent review⁷⁹ of three case studies of user education suggests that more innovative approaches to user education should be considered. The three approaches were peer mentoring, reverse mentoring (medical students coaching more senior staff) and outreach clinical librarian training. The outreach study provided qualitative evidence (as did the North Wales clinical librarian evaluation) of the importance of providing informal and formal support for evidence-based practice initiatives.

	Intranet (online) n=363	Internet (online) n=115	Sub- total (online) n=478	% of online	Quest. n=225	% of Quest.	Total	% of total n=703
Would gain from basic training	98	39	137	28.7	108	48.0	245	34.9
Would NOT gain from basic training	55	12	67	14.0	28	12.4	95	13.5
Basic training done	44	46	90	18.8	59	26.2	149	21.2
Missing responses	165	18	183	38.3	30	13.3	213	30.3
Would gain from ADVANCED search and appraisal	143	66	209	43.7	146	64.9	355	50.5
Would NOT gain from ADVANCE search and appraisal	26	8	34	7.1	19	8.4	53	7.5
Advanced training done	20	23	43	9.0	23	10.2	66	9.4
Missing responses	171	18	189	39.5	37	16.4	226	32.1

Table 7 Attitudes towards training provision

4.3.3 Importance of resource type to workplace needs

Figure 5 indicates the popularity of access to full text journals, specialist news and lists of events, guideline collections and procedure manuals and policies. Image collections, on the other hand are not a priority for most staff at present, and neither is quick reference information on a PDA. For some staff, patient education materials, and drug formulary information are not important and neither are clinical question answering services. There is most consensus about the importance of full text journals online and the lists of events and news for the specialist area (and the latter can, of course, appear in the current issues of the full text journal).

Questionnaire comments typically included:

'More full text journals, particularly (name of specialist) area.'

⁷⁹ Murphy J, Adams A. Exploring the benefits of user education: a review of three case studies. *Health Information and Libraries Journal* 2005 (Supplement 1): 45-58.

The specialist areas most often singled out and specified were for therapists, and healthcare scientists. As many respondents did not complete all questions on the questionnaire, the fact that 6-10% provided comments on the desirability of more full-text journals indicates their importance to the users. Even so, as a survey⁸⁰ of Australian occupational therapists' use of OTseeker suggests, there is a learning curve, in persuading occupational therapists to use a resource that assists them in implementing evidence based practice. Often, as a series of articles⁸¹ on resources for allied health professionals indicates, the specialist professional societies are invaluable for such groups, particularly for professions such as speech therapy which requires access to resources to linguistic and educational resources.

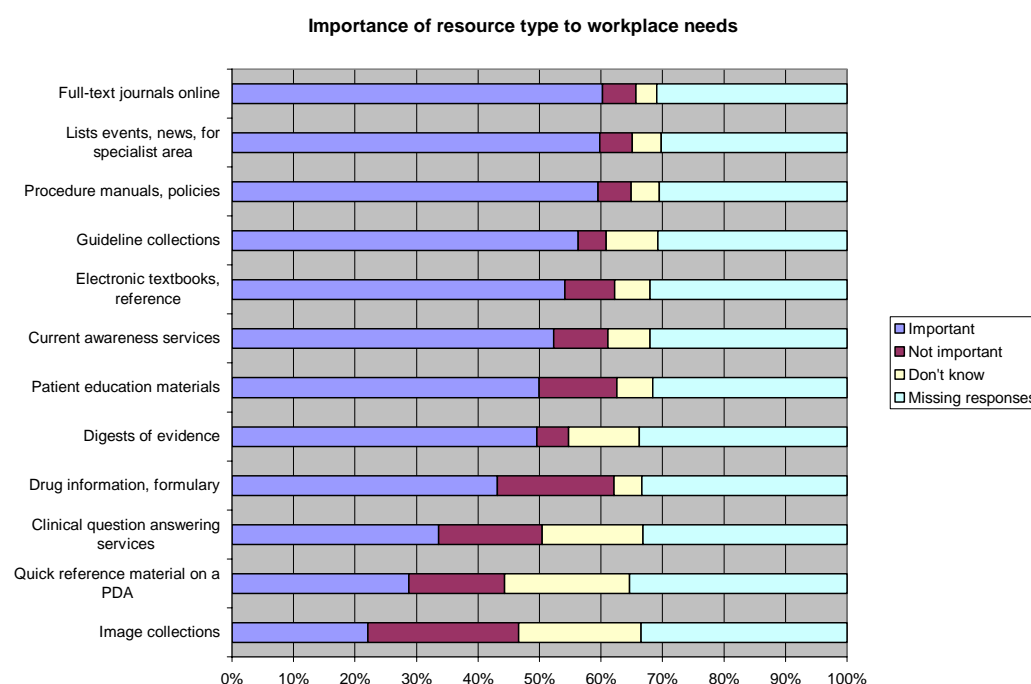


Figure 5 Importance of particular resources for the workplace

4.3.4 Importance of HOWIS e-library resources to workplace needs

Survey participants were asked which of the HOWIS e-library resources they deemed important, and the pattern is similar, though not identical to the pattern obtained when respondents were asked which resources they had used to answer a recent clinical question they had. However, there are resources which staff may value for occasional queries that they may not use all the time. If so, these may be valued more highly as 'important' than their importance seems to be, based on actual usage for a recent clinical question (as set out in Table 5). Taking an arbitrary figure of a 5% difference (in the last two columns of Table 8) the e-library resources that fall into the 'would like to have just in case' category are:

AMED, BNI, MEDLINE
Clinical Evidence, Cochrane Library
Oxford textbooks. BMJ Collections
NICE guidelines

⁸⁰ McKenna K. Bennett S, Dierselhuis Z, Hoffmann T, Tooth L, McCluskey A. Australian occupational therapists' use of an online evidence-based practice database (OTseeker). *Health Information and Libraries Journal* 2005; 22(3): 205-214.

⁸¹ Libraries for Nursing Bulletin. Special issue: Library and information services supporting allied health professions. 2005; 25 (3).

Resources valued on HOWIS	Intranet (online) n=363	Internet (online) n=115	Sub-total (online) n=478	% of online	Quest. n=225	% of Quest.	Total	% of total n=703	% of total n=703 (actually used, from Table 5)
AMED	28	9	37	7.7	76	33.8	113	16.1	9.7
BNI	34	3	37	7.7	67	29.8	104	14.8	8.1
CINAHL	61	9	70	14.6	117	52.0	187	26.6	22.6
EBM	17	12	29	6.1	23	10.2	52	7.4	5.5
HMIC	9	1	10	2.1	13	5.8	23	3.3	3.3
MEDLINE	118	66	184	38.5	152	67.6	336	47.8	42.7
PsychINFO	20	9	29	6.1	28	12.4	57	8.1	5.8
EMBASE	34	37	71	14.9	35	15.6	106	15.1	11.8
<i>Blank responses (OVID databases)</i>	221	47	268	56.1	0	0.0	268	38.1	37.8
Bandolier	42	31	73	15.3	43	19.1	116	16.5	12.1
Clinical evidence	41	34	75	15.7	71	31.6	146	20.8	11.0
Cochrane library	72	41	113	23.6	112	49.8	225	32.0	24.8
Doctor online	8	5	13	2.7	14	6.2	27	3.8	3.0
Effective healthcare bulletins	18	12	30	6.3	46	20.4	76	10.8	7.0
Effectiveness matters	15	9	24	5.0	29	12.9	53	7.5	3.7
Health evidence bulletins Wales	21	6	27	5.6	50	22.2	77	11.0	8.3
<i>Blank responses (Evidence based)</i>	259	57	316	66.1	2	0.3	318	45.2	44.7
ASSIA	8	2	10	2.1	9	4.0	19	2.7	1.1
WeBNF	12	39	51	10.7	10	4.4	61	8.7	7.0
Caredata	2	2	4	0.8	3	1.3	7	1.0	0.6
<i>Blank responses (other databases)</i>	342	76	418	87.4	2	0.9	420	59.7	60.5
Oxford textbooks	25	13	38	7.9	40	17.8	78	11.1	6.0
BMJ collections	52	37	89	18.6	80	35.6	169	24.0	19.6
Emerald full text	17	4	21	4.4	15	6.7	36	5.1	3.4
<i>Blank responses e-ref, e-journals</i>	299	74	373	78.0	2	0.9	375	53.3	52.1
NICE	101	55	156	32.6	152	67.6	308	43.8	35.0
E-guidelines	25	22	47	9.8	35	15.6	82	11.7	7.1
SIGN	29	38	67	14.0	35	15.6	102	14.5	10.5
UK blood transfusion & tissue	8	1	9	1.9	12	5.3	21	3.0	1.6
Transplantation guidelines	5	1	6	1.3	7	3.1	13	1.8	0.3
<i>Blank responses, guidelines</i>	256	59	315	65.9	0	0.0	315	44.8	51.4

Table 8 Importance of HOWIS e-library resources to workplace needs

4.4 Location of access to HOWIS

Respondents were asked in what ways they usually accessed HOWIS. Nearly half frequently access HOWIS via a shared computer, one in five has access to their own computer to access HOWIS, and one in five often accesses HOWIS from home (Table 9). As around a quarter of the respondents did not complete this question, the above proportions should be considered as minimum proportions – probably at least half the respondents share a computer, and maybe one in five access HOWIS over the Internet from home.

Usual means of accessing HOWIS	Intranet (online) n=363	Internet (online) n=115	Sub-total (online) n=478	% of online	Quest. n=225	% of Quest.	Total	% of total n=703
Work - shared computer	125	66	191	40.0	128	56.9	319	45.4
Work - remote access	28	8	36	7.5	28	12.4	64	9.1
Home/work - hospital residence	6	1	7	1.5	3	1.3	10	1.4
NHS library	28	2	30	6.3	60	26.7	90	12.8
Work - own computer	78	23	101	21.1	48	21.3	149	21.2
Home - via internet	67	18	85	17.8	27	12.0	112	15.9
Home - via dial-up access to work	9	9	18	3.8	26	11.6	44	6.3
Don't know	2	5	7	1.5	6	2.7	13	1.8
No answer	155	20	175	36.6	11	4.9	186	26.5

Table 9 Usual locations for accessing HOWIS

4.5 Librarian survey findings

These are collated under the headings of trends in usage, unmet needs, knowledgebase tools, and training options.

4.5.1 Perceived trends in usage

Library managers are very confident that usage of all resources is increasing among junior doctors, nurses, students, allied health professionals and consultants. Of these professional groups, the usage of both physical and electronic resources is reported to be increasing, with the exception of the consultants (7 library managers reported increasing physical usage, 4 reported decreasing physical usage).

There is some uncertainty about trends among administrators with 8 library managers reporting an overall increasing usage, and 4 reporting an overall decline.

Fewer library managers (8) were able to comment on some groups such as:

- pharmacists (use of electronic resources reported to be increasing everywhere, use of physical resources reported by 5 library managers as increasing and decreasing by 2 library managers).
- scientists, (8 library managers believe that their usage of both physical and electronic resources is increasing, no decreases noted)

Even fewer (2-5 library managers) were able to comment on usage by dentists, and ambulance staff, and the belief is that usage is decreasing rather than increasing, more so for physical resources rather than electronic resources.

4.5.2 Unmet needs

Clinical specialties that may have particular unmet needs are reported to be:

- Dentistry
- Ophthalmology
- Anaesthesiology
- Musculoskeletal
- Podiatry
- Dermatology
- Psychology
- Speech therapy
- Audiology

Clinical areas that have unmet needs are reported to include:

- Palliative Care
- Learning Disabilities
- Child Health

There was no consensus on particular specialties that deserve priority attention. There was, however, more agreement that GPs and community staff could be better served, and more attention generally to the non-medical and non-nursing staff groups. One manager mentioned social services staff working in and for the health service.

4.5.3 Knowledgebase tools

Views on the desirability of various knowledgebase tools varied, but there was some consensus on some items (noted in bold on Table 10).

Librarians were mostly unsure about the desirability of Federated searches through screen scraping, Z39.50 protocols, but they agreed that the ability to switch the federated search on or off by the library was important. Similarly, most wanted the ability to configure the way resources are presented, and they also agreed that for the user (presumably) a single interface was important. On the wishlist, one librarian commented that databases such as TRIP are useful as they bring in multiple resources in one search.

For searching, and personalisation, there was interest in allowing saved searches. Few offered opinions on RSS (really simple syndication).

On features that might support clinical networks, through document and report posting, there was some limited interest, although most agreed that the principle of open archiving should be supported.

There was consensus over link resolvers, with most agreeing that being able to direct users to local holdings, and to full text was crucial. Most agreed that concurrent user licences were highly desirable, and most agreed that provision of COUNTER compliant usage statistics was at the least important, if not crucial.

There is some interest in being able to define and set conditions for user groups through a more sophisticated authentication system such as Shibboleth.

Surprisingly few responses were obtained on the citation functionality question, a little surprising given the librarians' knowledge of the PubMed 'related articles' search. Perhaps the question was not phrased as well as it could have been, as anecdotal

evidence indicates that most librarians use this function on occasions as a way of identifying literature that may be hard to find other ways.

	Crucial	Important	Not Important	Not Sure
Federated IN (predefined)		4	1	6
Federated OUT (library determined)	1	8		3
Customer configurable resources	1	7	3	2
Single interface	3	8	1	1
Personalised desk top:	2	4		1
Search history save	1	4		
Search session save	2	4		
Alerts	2	2		
RSS	1	2		
Open Archive	2	6	1	1
Subject portal	2	1		
Community Portal	1	1		
Link resolver local holdings	8	4	1	
Link resolver fulltext	10	2		
Concurrent user licences	8	5		
COUNTER compliant	5	5	1	1
ATHENS		4		2
Shibboleth	6			1
Citation functionality	1	6		2
pre-indexed ISI	1	1		1
search citation	1	1		1
hypertext linked	1	1		1
related articles				1

Table 10 Views on knowledgebase tools

4.5.4 Training provided by health libraries

The emphasis is on personal training, although most libraries do provide group training as well as one-to-one training (Table 11). Comments indicated that some libraries provided, or were intending to provide outreach training. One commented on liaison with local ECDL trainers and another commented that printed handbooks were provided.

Type of training provision	Yes	No
One-to-one informal	13	
One-to-one formal	13	
Group	12	
Online tutorials	5	5
Integrated with induction	5	6
Community slots	5	5
Open Sessions	3	7

Table 11 Type of training provided by library services

4.5.5 Wishlist

Views from the users on constituted a long wishlist, which could be grouped as follows:

- Map of Medicine ('seems an excellent resource as it gives users information at the point of need') (4 mentions)

- More e-journals (*'key titles for each speciality, professional grouping'*) (4 mentions)
- Examination resources (exam tests, question banks, videos) (3 mentions)
- Local/national document management software (or knowledge management)
 - to organise local clinical governance activities and policies, and access practice and policies elsewhere (to save reinventing wheels)
 - accurate email and telephone directory for NHS Wales
- Internurse journals (2 mentions)
- Specialist clinical resources (various listed) and more on management, particularly the softer subjects, the human resources aspects
- Image resources (2 mentions)
- Specialist software
 - For users, SPSS
 - For users and librarians, reference management software (e.g. ENDNOTE)
 - For librarians and trainers, authoring tools for e-learning
- Critical appraisal support (CAPS, CATS, Medical Masterclass)

One comment also indicated that there is a future archiving problem emerging with the difficulty of locating, and downloading Assembly documents. Hard copy distribution would be useful.

Resources that are far less used now include CD-ROMs and videos, print indexes and print reference materials.

5 Synthesising the strands of evidence

This section considers the evidence from the literature review, together with the evidence from the survey work. The intention is to provide answers to the objectives set out for the project.

5.1 Meeting existing needs

The match with clinical, educational and service planning requirements is assessed separately (Section 5.1.1 clinical, Section 5.1.2 educational, and Section 5.1.3 service planning) although it is acknowledged that many queries involve a mix of purposes. Within each section (5.1.1 to 5.1.3) the following questions are considered:

- How important is it to the users to meet this need?
- How well are their needs met overall?
- Which aspects of their needs are not met, in general?
- Are there groups of staff whose needs are not met?
- Where is the evidence weak?

Section 5.1.4 then considers the functionality issues, and the Section 5.1.5 the accessibility issues.

5.1.1 Clinical content, and information for patients

The importance of meeting needs for information for routine clinical practice, and clinical governance, through HOWIS e-library relates to Sections 3.5.5, 4.1, 4.2, and 4.3
Synthesising the various strands:

Importance

Individual patient care and clinical governance are important reasons for using HOWIS, and most respondents noted they were successful in their search. Many of the actual queries noted a concern about 'what should be done' rather than 'what could be done'.

Overall, guideline collections, procedure manuals, and patient education materials are of slightly more importance to staff than drug formulary information. (Section 4.3.3)

The ratings suggest that some clinical content (e.g. Cochrane Library, NICE guidelines, Clinical Evidence) is deemed important to have, although it may not be used as frequently as its importance suggests. (Section 4.3.4)

Are needs met?

More respondents found obtaining information on drug or other therapies, and information/advice for patients and carers easy to obtain, rather than difficult to find. The main sources that staff appear to be using for information are:

- On HOWIS: MEDLINE, Cochrane Library, NICE, CINAHL and BMJ Collections (suggesting that some must be filtering information they obtain before handing it over to patients)
- Internet searches (search engine)
- Personal collections of books and journals
- Colleagues and library staff
- Resources available via personal professional membership (Sections 4.2.1, 4.2.2)

Which aspects of needs are not met?

The purely clinical needs appear to be met, and the pattern of successful searches also suggests that staff only go looking for information they think they can find. Unpicking some of the needs that staff may not acknowledge (as they are deemed too difficult to chase) is more difficult but there are a few clues from the data.

Social care information is rarely sought (from ASSIA, Caredata) (Section 4.2.1)

The low to middling use of Clinical Evidence, Doctor online, Effective Healthcare Bulletins, Bandolier, seems at variance with the perceptions of staff that they find information and advice for patients and carers easy to obtain – and patient education materials are deemed important Sections 4.2.1, 4.3.1, 4.3.3)

Procedure manuals and guidelines, and digests of evidence seem to be given higher importance than their usage indicates (Section 4.3.4)

Staff groups with particular needs

This was assessed by drilling down by role into responses for the ease of obtaining information for specific purposes (postal questionnaire only). Purposes, and staff groups, where at least as many staff indicated it was difficult, rather than easy to find information for particular purposes were:

- Complementary therapies – for allied health professionals, GPs, junior doctors, dentists
- Other non-drug treatments for junior doctors
- Case management for junior doctors

The librarian survey indicated a wide range of clinical specialist areas that may be poorly served by existing resources – and these may be areas where electronic journal provision would provide more equitable access to resources throughout Wales, cost-effectively. (Section 4.5.2)

Areas where evidence is weak

The number of responses from dental practitioners is too small in the postal questionnaire survey to provide a reliable indication of the gaps, but it seems that there may be many areas of unmet needs among dental practitioners. For example, although drug therapy information is not a major problem for most staff groups, both dental practitioners indicated that they found drug therapy and diagnostics information difficult to find.

Ambulance staff did not answer the question indicating the type of areas where they found information difficult to obtain.

The librarian survey responses confirm that the ambulance staff, and the dentists will need more work, to assess what might be useful – and used. (Section 4.5.2)

5.1.2 Education and CPD

This section focuses on personal CPD, and the requirements for supervision of students on placement. The themes are similar to Section 5.1.1 as they are linked through clinical governance.

Importance

The HOWIS e-library resources are used primarily for educational purposes – CPD and individual personal research needs are prime motivations. (Section 4.1). On the other hand there is some contradictions as the English user needs study indicated that the lack of protected time for study meant that some staff perceived that using information services in working time is not deemed time well spent, and some respondents in the RCN survey noted that there was not sufficient practical support for CPD activities in the workplace. (Section 3.5.5, 3.5.6)

Are needs met?

The RCN survey identified the main resources identified as 'very useful' for completing an assignment as (in descending order of importance) journal articles or reports, books, electronic databases and the local health library. For keeping up to date, journal articles

and reports predominate, but after that come Internet websites, publications from their own organisation. (Section 3.5.6)

The survey responses indicated that some CPD needs were easy to meet, but, equally, responses also indicated that finding information for CPD was difficult, suggesting that a wide range of resources may need to be used. (Section 4.3.1) The English user needs study suggested that professional organisations fill in many of the gaps at local and national level (Section 3.5.5). The other resources used by survey respondents included their personal collections, Internet (search engines), professional membership resources, colleagues, and library staff (Section 4.2.2).

The Scottish research indicates that clinical and educational networks might be supported (Section 3.5.3). The librarians note that some multidisciplinary areas (e.g. palliative care, learning disabilities) need support (Section 4.5.2).

Which aspects of needs are not met?

The RCN survey noted that staff who worked in a culture supportive of CPD and evidence-based searching were more willing to continue searching in their own time. Changing practice may require the entire package: good technical infrastructure and access to the Internet, supportive library and more support at work. (Section 3.5.6)

Staff groups with particular needs-

Staff who have come in from a different background (from higher education, from another country) may have particular problems in adjusting to a different set of resources, and how these are set out. If users are accustomed to a virtual learning environment format then resource provision may be expected at the point of need – read this to get more information on this specific issue, rather than expecting users to know which knowledgebases to search for a particular type of information. (Section 3.7)

Analysis of the postal questionnaire responses found that information relating to supervision (staff/students) is problematic for junior doctors and dentists.

Areas where evidence is weak

The indications are that dentists have difficulties in accessing CPD resources, but the evidence is weak. Given some of the difficulties in deciding how to code the staff group of some responses (e.g. some consultant biochemists presumably ticked the 'consultant' box rather than 'healthcare scientist') and this type of problem affected the smaller staff groups there may be some unidentified staff group needs.

It is difficult to be certain but there seems to be a gulf in awareness between the FE sector and the HE/NHS sectors. Provision for supporting education and CPD among the non-professional and support staff may need attention.

5.1.3 Service planning, commissioning and evaluation

This section covers the issues around service planning, commissioning, reconfiguration and audit.

Importance

For some groups of staff, information about service planning, commissioning and audit is not rated as 'applicable' to them.

Are needs met?

The HOWIS e-library does not specifically contain some of the resources that might be used, but perhaps the linkages between the e-library resources and the other HOWIS resources need to be clearer. It is possible (but not certain) that the usage of Emerald full-text collections corresponds to some use by managers of such materials at home.

Which aspects of needs are not met?

The English user needs survey indicated an unmet need for 'best practice' information about clinical development projects (Section 3.5.5)

Staff groups with particular needs

Many staff groups find this type of information hard to find, judging from analysis of the postal questionnaire responses:

- Service reconfiguration (allied health, managers, consultants, junior doc GP, dentists)
- Service commissioning (allied health, managers, consultants, junior doc GP, dentists)
- Audit for allied health, consultants, GPs, dentists

Areas where evidence is weak

The coding difficulties for the smaller staff groups make the evidence weak in the survey. Anecdotal evidence from the expert informant interviews suggests that librarians perceive a need for British management literature, but that ASSIA usage tends to be low. (stakeholder 4)

There also seems to be some uncertainty on resource usage among administrative staff groups in the library manager survey (Section 4.5.1) suggesting that resource provision could be improved for those groups of staff.

5.1.4 Meeting functionality requirements

The observation that the pattern of usage indicated from the usage statistics differed more for the less well known knowledgebases than for the well known knowledgebases suggests that some users have problems in remembering what they used on a particular occasion. In addition to HOWIS e-library resources, Internet searching is very popular, and in effect part of the personal collection.(Section 4.2.2)

This concurs with the conclusion of the English user needs study (Section 3.5.5) that a priority was:

- Simpler navigation with a 'Google' type search engine, and more personalisation (as already planned)

As interviewees noted:

'The reason Google's so attractive is that you don't have to know anything about where things are located, about the structure of a website. You don't have to drill down through the appropriate headings and sub-headings. You just put in your term and you have a fantastic powerful search engine...comes up with a magic answer. So I think any system, it's helpful if people can do it that way.' (stakeholder 8)

'Using HOWIS for clinical governance (title of leaflet) – it tells you how to access, it gives you the website address...but you see, you've got to choose where you go to and then put in your search terms so you might have to go into several databases and actually not find what you're looking for, whereas you could just put your subject area in and the search engine will say what sites will have that information for you.' (stakeholder 11)

Library managers agreed that personalisation of the interface was desirable, and that COUNTER compliant statistics were important or even crucial (Section 4.5.3).

The type of materials required indicated (Section 4.3.3) that the following areas are priority for most staff:

- Full-text journals

- Specialist news and lists of events
- Guideline collections
- Procedure manuals and policies

There is some uncertainty about the desirability of clinical question answering services, digests of evidence, image collections and the applicability of quick reference material on a PDA. Expert informant interviews (Stakeholder 4) indicate that provision of an images database (ImagesMD) has proved popular in England, and that it was necessary to purchase a mental health collection to meet the unmet needs of mental health practitioners.

The implications are that the location of local information (e.g. on procedure manuals, guidelines) needs to be linked clearly to information that might be available through HOWIS e-library. Librarians were very keen to support the use of local link resolvers to local holdings and to full text. (Section 4.5.3)

5.1.5 Meeting accessibility requirements

Nearly half the respondents usually accessed HOWIS e-library resources through a shared computer at work. More used an Internet connection than a direct dial-up access to work when accessing HOWIS e-library resources at home. Interviewees reported that some Trusts, for reasons associated with the IT infrastructure could not grant Internet access to staff. Community pharmacists do not have access to e-library resources that are only available on the Intranet. Interest in using wireless devices seems in the early stages. Handheld devices are useful in some settings for clinical librarians who need rapid access to the literature databases when assisting on a ward round. One librarian mentioned that downloads to a PDA of some resources would be useful for some users.

Some stakeholders mentioned that use of PDAs and resources tailored for PDAs (e.g. FirstConsult, UpToDate) was more common in the USA and some European countries (*stakeholder 17*). A comparison⁸² of PDA resources suggests that InfoRetriever and UpToDate have large system memory requirements. On the other hand, FirstConsult does not have the search functions other resources have. All three provided evidence-based clinical information in a handy format.

Librarians wanted more sophisticated authentication such as Shibboleth to better differentiate user groups, but in a way that works seamlessly for the users.

5.2 Future needs of the e-library

5.2.1 Training and support, and links with existing library services

The English User Needs Study, together with the earlier study by TFPL on the library policy review suggested that local services should act as ambassadors for national services, and that there should be a reduced focus on local collection building. Libraries should be more active in 'learning and interaction', with the library acting more as a learning and meeting centre. There should be more emphasis on multidisciplinary teams. The overview of training needs analysis for health library staff in England⁸³ noted that there were two career routes developing for librarians – one as specialists (in training, clinical librarian or outreach posts) and one as library managers. The need for library staff to support other staff in learning support, particularly e-learning support was noted (p.40).

⁸² Burkiewicz JS, Vesta KS, Hume AL. Update in handheld electronic resources for evidence-based practice in the community setting. *Annals Pharmacotherapy* 2005; 15 November (epub information only from MEDLINE)

⁸³ Urquhart, Christine, Spink, Siân, Thomas, Rhian. *Assessing training and professional development needs of library staff*. (for National Library for Health). Aberystwyth: Department of Information Studies, UWA, 2005

The English User Needs study recommended:

- Developing a range of information skills programmes, tailored to the profile of needs for particular groups (and more promotion of resources).

For all staff, the importance of e-learning in Wales was stressed by several interviewees, and one concern was the improvement and modernisation of clinical processes, and patient pathways. Another was dealing with placement students – and their supervisors.

'E-learning relating to management type stuff...would include stuff about modernisation techniques...how you slicken up our pathways, and how you can analyse capacity, demand and activity in quantitative terms.' (stakeholder 8)

'Problems you had facing students out on placement, some would be in a hospital with major library facilities, others out on a community placement with no library facilities... and the only access they've got to material is via the Internet and e-type products... We can't site there any more and we'll develop a course in site X and expect people to travel to that course. They are often unable to, the culture perhaps in which they've grown up is that that you don't travel that far and so in order to develop them we really need to bringing the education out to the people.' (stakeholder 12)

Although demand for clinical question answering services appeared lukewarm in the user needs survey, that could partly be explained by a lack of awareness of the possibilities – not knowing what these services could offer. If learning is to be relevant to the individual, perhaps it is important to recognise the learning gaps, the clinical questions that need answering – and clinical governance embraces this.

'It's something we have discussed in the [name] in terms of when other people are trying to find out what is happening in the rest of Wales, to actually find a one route where everybody can come in with a question – I have to say I use the ATTRACT service quite a bit and I find that very useful and very speedy reply and of course they do the work for me and I don't have to do anything – all I have to do is formulate my question. That's an extremely useful service.' (stakeholder 11)

However, it is recognised that individuals work in teams, and the practice of the team may need to be supported and developed. The NLIH (National Leadership and Innovation Agency in Health) has a Service Development Directorate that runs collaboratives to try and support, help and skill people with the latest tools and techniques for improving services, developing care pathways.

'We've got an online learning laboratory which sits on our NHS Wales intranet site... a sort of gateway onto existing HOWIS and other e-resources but putting the gateway designed to help people that we're working with get to the information we think would be particularly helpful to them...bibliographic information...current awareness services...data and information services...electronic learning...general reference...multimedia resources...publications online (things like Welsh health circulars)...and finally...subject gateways which is really where we have a particular work programme or a development programme. Underneath the heading of that development programme we then put hopefully what are useful resources that people who are on those programmes can go to quite quickly.' (stakeholder 9)

5.2.2 Restructuring of health library services, as required for IHC

The North Wales clinical librarian project evaluation⁸⁴ echoed the need to rethink library services, with an area or regional team approach to service provision, to enable cost-effective provision of specialised clinical librarian type services. This type of library service reaches the non-traditional library user, provides critical appraisal support and

⁸⁴ Urquhart, Christine, Durbin, Jane, Turner, Janet. *North Wales Clinical Librarian Project. Final project report.* Aberystwyth: Department of Information Studies, UWA, 2005.

knowledgebase training at the point of need (e.g. in journal club support) but the service is quite costly in terms of library staff time.

The English User Needs study suggested that the business processes associated with traditional library tasks associated with document delivery need to be re-engineered. (Section 3.5.5). For example, over 75% of respondents in their survey indicated that they were willing to order articles online without library staff support, and a similar percentage thought that the delivery of electronic articles over the Internet would be valuable. On the other hand, it must be remembered that this represented the views of those already happy with online services as this was an online survey.

Interviewees mentioned that librarians were an underused resource at present, particularly for some of the managers, who (as in the English User Needs study) tended to use their own professional networks.

'And if we can try and help point some of our leaders and manager more into their (librarians') direction to say look you're not on your own when you have to write a particular report and you've been asked to put a section asking which is the evidenced recommendation, you can work with these sorts of skilled professionals to help you do just that...I would be really keen to see our library and information services people come to the fore much more as well perhaps...I do think they're a completely underestimated resource.' (stakeholder 9)

Librarians provide a wide variety of training and support services, and need to be supporting themselves in the most appropriate, and effective ways of providing training and support for their users. Perhaps policies for user training and support need to be tackled at several levels:

- making the interface more intuitive, or providing searching tools appropriate for the user's specific needs (*library staff should be able to contribute knowledge on the normal errors made by users, and pilot use of particular searching tools*)
- providing formal training (*tailored to the needs of particular groups*)
- supporting cascaded training, reverse mentoring, peer training (*training the trainer*)
- providing specific, but remote help on a particular query. (*help desk support, ask a librarian*)
- informal training (*personal help in the library*)
- promoting and developing e-learning tutorials (*an area where FE, HE and NHS could work together more?*)

Content providers such as Proquest have spearheaded remote training for librarians, and that type of update training has proved successful. Given the time required to develop good e-learning tutorials, it makes sense to work with content providers if they are prepared to provide marketing and training materials. Support and training provided by the library services for use of e-library resources needs to be part of the overarching policy for Access to Learning (A2L) as well. Last but not least, an authentication mechanism that allowed identification of the main staff group of the user would help to monitor whether training was improving the uptake of particular resources. The usage statistics do not provide the necessary level of detail at present.

5.2.3 Links with the Single Record

Most of the discussion focuses on how to link the evidence, usually in the form of guidelines to the Single Record. However, one interviewee noted the need to see the wider picture on adopting an evidence-based approach. Evidence creation may start in the correct coding of patient records (requiring a data dictionary of terms), evidence review will require access to policy documents and guidelines, and practice improvement, incorporation of evidence into practice, and benchmarking may require access to e-learning as well as tools to analyse practice.

'Those are the three big areas. Evidence-based medicine, training and something around policy structures and organisations in Wales.'

In England, the Map of Medicine has been adopted in some clusters as a way of providing an overarching framework for improving clinical practice supported by IT – a process approach. The Map of Medicine is being trialled (2005) in North Wales at present. The aim of the Map of Medicine is to serve as:

'An education and training tool...It's about knowledge and knowledge mobilisation' (stakeholder 5)

Another important feature is the legal and ethical support offered in any possible negligence claim.

'they were able to build a very robust IT backend for the system so that we could retain version control so that in 8 years time when a doctor stands up in a court of law we can roll back to the map or knowledge base that was in use at the time.'

Content can be localised, with local administrative information inserted, links to own local documents, and, at a higher level, to the flow charts (with proper authentication). There are three levels of adaptation (personalisation, localisation of administrative information and construction of different pathways and flow charts). Localisation is seen as the responsibility of clinical governance staff in Trusts, the knowledge managers (librarians) and general project management staff (from stakeholder 5).

The links with an electronic patient record arise in various ways, e.g.:

- Between a prescribing module and the Map
- Between a 'referral' part of the pathway and the 'booking' module.

It is recognised that some guidance may need to be personalised or localised, and that there are levels of authority in the guidance. The problem is not just locating the guidelines but trying to sort out where the links are, and what the relationships might be.

'It would probably be useful for have something easily available for people to see about what the standards are and where they link to other standards from NICE or whatever, or other literature reviews to have sort of links in to these....The distinction between the evidence that's just around, and general guidelines that are around and the ones that have in some sense been formally adopted.' (stakeholder 8)

Several interviewees suggested structures around the Single Record that reflected the thinking behind the Map of Medicine.

'So doctors can look at it (Royal College guidelines on HOWIS) and see what's the best imaging procedure is, to request a particular condition. That's evidence based. Clearly the best way of doing it would be if they electronically requested a procedure in a department...if there was some automatic prompt...and they got the prompt at the time of requesting.' (stakeholder 8)

5.2.4 Links between NHS and HE/FE provision and support

The main links should concern purchasing, and further training and support. At present some traditional links are in place (former postgraduate medical library network, AWHILES) but there seems little linkage between the HE sector for health libraries and the FE sector supporting the NVQ type courses, and the RSC network. (Section 3.7)

The library manager survey indicated that training provided is usually personal, and often one to one. While effective this is immensely costly in staff time, and supplementary support is necessary. There are more innovative forms of user education training and support (Section 4.3.2) that should be explored, and provision from content providers for marketing and training support should be examined carefully as well:

'We commit, contractually to deliver very specific training and marketing support. We understand that training does have an impact on usage and also a perception

from the customers that they are getting value for money, because they (users) are using it properly' (stakeholder 13)

Appendix 1 Survey questions

Code:

Q.1. Please tick the category that most closely resembles your job role.

Nurse (acute sector)		Consultant	
Nurse (community, mental health etc.		GP	
Midwife (acute or community)		Junior doctor (Spec.registrar or SHO)	
Healthcare assistant/auxiliary		Other hospital medical/surgical staff	
Healthcare scientist		Ambulance staff (not manager)	
Pharmacist		Clerical and administration	
Allied health professional		Audit/research	
Manager (any sector)		Dental practitioner	
Public health		Other	

Q.2. For a recent occasion when you used HOWIS, why did you look for information on HOWIS? Please tick all categories that apply.

Continuing professional development (course or formal education)	
Updating (personal or team)	
Teaching (e.g. for supervision of students)	
Clinical governance / guideline development	
Patient care (for care of individual patient)	
Patient care (for commissioning, service delivery, strategic development)	
Research (funded/endorsed)	
Research (personal)	
Audit	
Legal/ethical issues	
Other	

Q.3. What was the question/query area ? Please give a brief outline.

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Q.4. Which resources do you remember using, e.g. on HOWIS e-library on that occasion? Please tick all categories that apply

Databases accessed via OVID		Other databases	
AMED (Allied & Complementary Medicine)		ASSIA for Health	
BNI (British Nursing Index)		WeBNF	
CINAHL (Nursing and Allied Health)		Caredata	
EBM Reviews (including ACP Journal Club, EBMZ)		Electronic journals	
HMIC (Health Management)		e-books	
MEDLINE		Oxford Textbooks	
		BMJ Collections	

PsychINFO		Emerald full text	
EMBASE / Excerpta Medica		Guidelines	
Evidence-based not via OVID		NICE	
Bandolier		EGuidelines	
Clinical Evidence		SIGN (Scottish Intercollegiate Guidelines)	
Cochrane Library		UK Blood Transfusion & Tissue Transplantation Guidelines	
Doctor Online			
Effective Healthcare Bulletins			
Effectiveness Matters			
Health Evidence Bulletins Wales			

Q.5. Did you use other resources, or ask other people for assistance? Please tick all categories that apply.

Books – personal collection		NHS library resources (paper)	
Journals – personal collection		Own NHS library resources (electronic/Intranet)	
Colleagues		Internet search (e.g. Google)	
Library staff		PubMed	
Resources available through personal professional membership		Other	

Q.6. Were you successful in your search?

YES		NO		SEARCH NOT YET COMPLETE	
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Q.7. Generally, how easy do you find searching for evidence to assist in the following?

	EASY	DIFFICULT	NOT APPLICABLE
Drug therapy (prescription drugs)			
Other treatments not involving drugs			
Diagnostics			
Complementary therapies			
Service reconfiguration/improvements			
Service commissioning			
Audit			
Supervision of staff/students			
Own CPD			
Advice to patients and carers			
Case management (social and health care)			

Q8. Would you value basic or advanced training in searching for evidence?

	WOULD GAIN FROM...	WOULD NOT GAIN FROM...	HAVE DONE TRAINING
Basic training in			

information searching			
Advanced searching and appraisal			

Q.9. How important are the following types of resources to your work?

TYPE OF RESOURCE	IMPORTANT	NOT IMPORTANT	DON'T KNOW
Digests of evidence			
Guideline collections			
Lists of current events, current news in your specialist area			
Current awareness services, e-alerts			
Procedure manuals/ local protocols/ policies			
Patient education materials			
Electronic textbooks/reference			
Full-text journal articles (online)			
Drug information – formularies etc.			
Quick reference material on a PDA			
Image collections			
Clinical question answering services			

Q.10. How do you usually access HOWIS? Please tick all categories that apply.

At work (shared computer, on Intranet)	
At work (own computer, on Intranet)	
At work (via Internet for remote access)	
At home (via Internet)	
At home (hospital residences)	
At home (via dial-up access to work)	
NHS Library	
Don't know	

Q.11. Which of the following HOWIS e-library resources are important for your work? Please tick all categories that apply.

Databases accessed via OVID		Other databases	
AMED (Allied & Complementary Medicine)		ASSIA for Health	
BNI (British Nursing Index)		WeBNF	
CINAHL (Nursing and Allied Health)		Caredata	
EBM Reviews (including ACP Journal Club, EBMZ)		Electronic journals e-books	
HMIC (Health Management)		Oxford Textbooks	
MEDLINE		BMJ Collections	
PsychINFO		Emerald full text	
EMBASE / Excerpta Medica		Guidelines	
Evidence-based not via OVID		NICE	
Bandolier		EGuidelines	
Clinical Evidence		SIGN (Scottish Intercollegiate Guidelines)	
Cochrane Library		UK Blood Transfusion & Tissue Transplantation Guidelines	
Doctor Online			

Effective Healthcare Bulletins			
Effectiveness Matters			
Health Evidence Bulletins Wales			

Q.12. Are there other resources that you use regularly? Please list and indicate why they are important.

Q.13. Are there resources that are not available to you at present, and which you believe would be useful for your work?

THANK YOU FOR YOUR COOPERATION. PLEASE RETURN YOUR COMPLETED QUESTIONNAIRE TO:
(sticker or address for library)

NB Formatting different in questionnaire distributed.

Appendix 2 Focus group (librarian) briefing paper

KNOWLEDGE BASE SUPPORT TOOLS

Briefing paper

There are two main types of support tools that we think need to be discussed, but we are open to suggestions!

First, there is the challenge of encouraging health staff to use the appropriate knowledgebase at the point of need, or point of care. How do they get – quickly and easily – from clinical question, with patient, using a tablet or ward terminal to an answer, via the knowledge bases themselves, or (more likely) something derived from the knowledge bases, such as:

- clinical question answering services (e.g. something like the Primary Care Question Answering Service on NeLH or TRIP)
- care pathways (particularly services such as Map of Medicine)
- clinical guidelines (general)
- local protocols?

How useful is it to provide some sort of prompt to health staff to consult guidelines? How could you make consulting the evidence something that health staff might browse when they have a couple of minutes to spare, to see what is new?

Is there any value in providing 'hot topics in our area'?

How do the objectives of the All Wales Clinical Networks fit into some of the objectives that the libraries might have in supporting and promoting the use of knowledgebases among health staff.

Second, there is a range of functionalities that knowledgebase platforms can offer users to make searching easier, more efficient, and more effective – from both the perspective of the librarian and the library user. These include:

- link resolvers (enabling a library to integrate its digital information resources, usually to connect bibliographic information within a knowledgebase to the electronic full text of journal articles, but you can also have local link resolvers to let users know that the library holds the print copy of a journal, for example)
- federated search engines (using a common interface, instead of interfaces that are specific to specific knowledgebase platforms)
- usage statistics that are COUNTER compliant – making it easier to compare usage
- differentiation between user groups (authentication and authorization – who are you, and what are you allowed to do) (Shibboleth digital rights)
- cross database searching with de-duplication of records
- citation searching (e.g. ISI, PubMed)
- personalization of the interface.

The purpose of the focus group workshops is to help us

- identify knowledgebase support tools that need to be considered
- identify particular priorities for further discussion.

Appendix 3 Librarian survey

Library Manager Survey

Q1 What are the principal user communities at your library and trends in usage? **Please type x against all that apply, whether usage is increasing or decreasing.**

	Total Overall Usage		Physical Usage/Visits		E-resource Usage	
	<i>Increasing</i>	<i>Decreasing</i>	<i>Increasing</i>	<i>Decreasing</i>	<i>Increasing</i>	<i>Decreasing</i>
Consultants						
Junior Drs						
Nurses						
Pharmacists						
Scientists						
Allied Health						
Dentists						
Administrators						
Students						
Ambulance						
Other (e.g.patients)						

Q2 What specialist user groups, if any, need to be better served in your area? e.g. Musculoskeletal, Child health, Oral Health

Q3 What specialist user groups, if any, would you like to reach that you presently do not?

Q4 What knowledge-base support tools would you consider helpful? **Please type x against all that apply.**

	Crucial	Important	Not Important	Not Sure
Federated searches IN (screen scraping across dBs or Z39.50/XML protocols etc., compliant)				
Federated searches OUT (searching can be pre-defined and switched on/off by library or user)				
Customer configurable resources				
Single user interface				
Personalised desk top: Saving search history Saving previous search sessions Alerts RSS (Really Simple Syndication) feeds				
Open Archive Infrastructure Subject Specific Portals e.g cancer Community Specific Portals e.g.				

dentists, radiographers				
Link resolvers to local holdings				
Link resolvers to full-text				
Licences for concurrent users				
COUNTER compliant usage statistics				
ATHENS authentication Shibboleth international standard managing digital rights/authorisation to differentiate user groups				
Citation functionality pre-indexed (ISI citation index) search citation (searching on part name, part title etc.) hypertext linking to other articles <i>related articles or find similar</i> search				
Others: Please elaborate.				

Q5 How is training and support provided at your library? Please type x against all that apply.

	Yes	No
One-to-one, informal as needed on demand		
One-to-one, formal pre-arranged		
Group sessions		
Directions to online tutorials		
Integrated with induction training		
Regular slots with particular user communities		
Regular slots as open sessions		
Other Please elaborate		

Q6 What is your ideal wish list of resources? e.g. clinical pathway software / Map of Medicine etc. Please list anything you feel would help your users, and yourself to aid your service provision.

Q7 Are there any resources at your library that you feel are redundant due to lack of use? Please list.

Thank you for your cooperation.

NB Formatting was different on the survey distributed.

Appendix 4 High impact nursing and multidisciplinary clinical journals

Academic Press- Elsevier	Exp Eye Res (UK)
Adis	Drug Aging (New Zealand)
Alcohol Res Documentation Inc	J Stud Alcohol
American Association Cancer Research	Cancer Epidem Biomar
American Association Clinical Chemistry	Clin Chem
American Association Critical Care Nurses	Amer J Crit Care
American College Nutrition	J Am Coll Nutr
American Institute of Nutrition	J Nutr
American Medical Association	Arch Ophthalmol - Chic
American Physical Therapy Association	Phys Ther
American Psychiatric Publishing	Am J Geriat Psychiat
American Public Health Association	Am J Public Health
American School Health Assoc	J School Health
American Society Clinical Nutrition	Am J Clin Nutr
American Society Investigative Pathol	Am J Pathol
American Society Pharmacology Exp Ther	Pharmacol Rev
Annual Reviews	Annu Rev Nutr Annu Rev Pharmacol Annu Rev Publ Health
Arnold Hodder Headline	Stat Methods Med Res
Assoc Research Vision Ophthalmology Inc	Invest Ophth Vis Sci
Bioline SAS	Int J Immunopath Ph
Blackwell	Value Health (USA) Milbank Q (USA) Health Serv Res (USA) Birth (USA) J Adv Nurs (UK) J Clin Nurs (UK) Neuropath Appl Neuro (UK) Int J Epidemiol (UK) Addiction (UK)
BMJ Publishing	Qual Saf Health Care Brit J Ophthalmol Tob Control
CABI Publishing	Brit J Nutr
Churchill Livingstone	Midwifery
College American Pathologists	Arch Pathol Lab Med
CRC Press	Crit Rev Cl Lab Sci
Elsevier	Neurobiol Aging (USA) Ageing Res Rev (Ireland) Mech Ageing Dev (Ireland/Switzerland) J Health Econ (Netherlands) J Pain Symptom Manag (USA) Clin Chim Acta (Netherlands) J Midwifery Wom Heal (USA) Surv Ophthalmol (USA) Ophthalmology (USA) Amer J Ophthalmol (USA) J Orthop Res (UK) Gait Posture (Ireland) Eur Spine J (USA) Trends Pharmacol Sci (UK) Adv Drug Deliver Rev (Netherlands) Drug Discov Today (UK)

	Amer J Prev Med J Electromyogr Kines (UK) Drug Alcohol Depen (Ireland)
Emory Eye Centre	Mol Vis
Gerontological Society America	J Gerontol A-Biol
IEEE	IEEE T Neur Sys Reh
Int Society Brain Pathology	Brain Pathol (Switzerland/USA)
John Wiley	Res Nurs Health (USA) J Pathol (UK) Med Res Rev (USA)
Journal Bone Surgery Joint	J Bone Joint Surg Am
Karger	Dement Geriatr Cogn (Switzerland)
Lippincott Williams Wilkins	Med Care Acad Med Ther Drug Monitor Nurs Res Cancer Nurs Adv Nurs Sci CIN-Compu Inform Nu Curr Opin Clin Nutr Spine Clin J Sport Med Clin Orthop Rel R J Neuropath Exp Neur Am J Surg Pathol Epidemiology Am J Phys Med Rehab Alcohol Clin Exp Res
Mosby	J Lab Clin Med Heart Lung Clin Pharmacol Ther
Nature Publishing	Lab Invest (USA) Int J Obesity (UK) Modern Pathol (USA) Nat Rev Drug Discov
North American Assoc Study Obesity	Obes Res
OUP	Am J Epidemiol (USA) Alcohol Alcoholism (UK)
Pergamon-Elsevier	Exp Gerontol Clin Biochem Prog Retin Eye Res Prog Lipid Res Pharmacol Therapeut Alcohol
Project Hope	Health Affair (USA)
Sage	Nurs Sci Quart Neurorehab Neural Re
Sigma Theta Tau Int	J Nurs Scholarship
Slack Inc	J Refrac Surg
Springer	Biogerontology (Netherlands) J Mol Med – JMM Rev Physiol Bioch P Support Care Cancer (USA)
Taylor & Francis	Crit Rev Fod Sci (USA) J Rehabil Med (Sweden) Disabil Rehabil (UK) Addict Biol (UK)

	Substan Use Misuse (USA)
US Dept	Environ Health Persp
Walter de Gruyter	Clin Chem Lab Med
WB Saunders	Osteoarthr Cartilage (UK) Arthroscopy (USA) Human Pathol (USA) Arch Phys Med Rehab
WHO	WHO Tech Rep Series

Notes: First ten for all categories, except nursing (15) and substance abuse (only 8 in list)